JULY 23, 1936

FIRST AERO WEEKLY IN THE WORLD

REGD. AT THE G.P.O. AS A NEWSPAPER

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FLIGHT

1936

The AIRCRAFT ENGINEER AND AIRSHIPS

No. 1439
Vol. XXX

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The AIRCRAFT ENGINEER AND AIRSHIPS

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The Other Aviation

FRENCH aviation circles have become accustomed to speak of the new light plane movement, including the *Pou-du-Ciel* amateur-built and flown, as *l'autre aviation*. That is rather a misnomer; it is intended to describe a radical departure, whereas actually it includes merely a certain branch of aviation in general. The term might be applied with much more justification to Autogiro flying of the sort which to-day's demonstration among the gorse-bushes of Hounslow Heath inaugurates. Jump-starting has virtually introduced a new form of flying altogether, and one which may affect profoundly the future history of private flying.

The fact that a start from quite a small field is now proved to be perfectly feasible alters the whole picture. *Flight* does not believe that the Autogiro will ever supplant the aeroplane; it does not regard the two types of aircraft as rivals, but rather as complementary to one another. Each can do something, or has something to offer, which the other lacks.

If one stops to think for a moment, it becomes obvious that the jump-start Autogiro represents the greatest contribution towards popularising private flying, used in the sense made familiar by the car owner, of any aircraft so far produced; and it does it, not by virtue of cheapness, absence of stalling danger, or any of its flying characteristics, but indirectly by making possible decentralisation. So long as an aircraft of any kind requires specially prepared aerodromes, there must be congestion at those aerodromes. If some William Morris of the air came along and produced the £100 aeroplane, what would be the result? The air in the vicinity of aerodromes would be full of aircraft and the danger of collisions, particularly in poor visibility, would be sufficient to provide a serious check. With the jump-start Autogiro, on the other hand, almost any field in the country becomes a potential "girodrome," if the term be permitted, and a given number of machines in the air at any given moment will be "spread out thinly" instead of being concentrated.

The picture can readily be developed. If we ever have as many Autogiros as we now have cars, they will not be confined to narrow, crowded air lanes, but will be scattered about. That in itself might constitute a danger in thick weather, but for one of the Autogiro's flying characteristics—that it is possible to slow down to some 15-20 miles per hour without fear of stalling. At that speed the risk of collision is far smaller, and the pilot has much more time to decide what to do, than in aeroplanes approaching each other at anything from 50 m.p.h. upwards. A forced landing could be brought off successfully in almost any field, and even at the worst the pilot would probably escape with a shaking even if the machine were badly damaged.

Military Uses

It is a somewhat curious fact that for military work the Autogiro is of very little interest to the R.A.F., but is likely to have very important uses with the Army and Navy. Had it been otherwise, it seems likely that this type of aircraft would have made more rapid progress, as in that case Government assistance in a more generous measure (one does not forget that Mr. Wimperis, Director of Scientific Research, did help Mr. de la Cierva a great deal in the early days) would probably have been forthcoming.

As it is, Air Commodore J. G. Weir deserves the very greatest praise for his share in the development of the Autogiro. But for his faith in the ultimate success of the type, a faith backed by good hard cash, we might still be at the stage of starting the rotor by deflecting the airscrew slipstream. He and those associated with him made it possible for Mr. de la Cierva and other technicians to develop, improve and perfect the technical features until a point has been reached when it can be said that the type is a practical flying machine just embarking upon a period of natural growth.

The Booking Anomaly

FROM time to time *Flight* has referred to the unfair and even ridiculous state of things by which only two—or, by arrangement, three—of this country's air line companies may profit by the facilities offered by the big booking houses. Yet, for very good reasons of "live and let live," these houses can take bookings for all the bigger foreign companies.

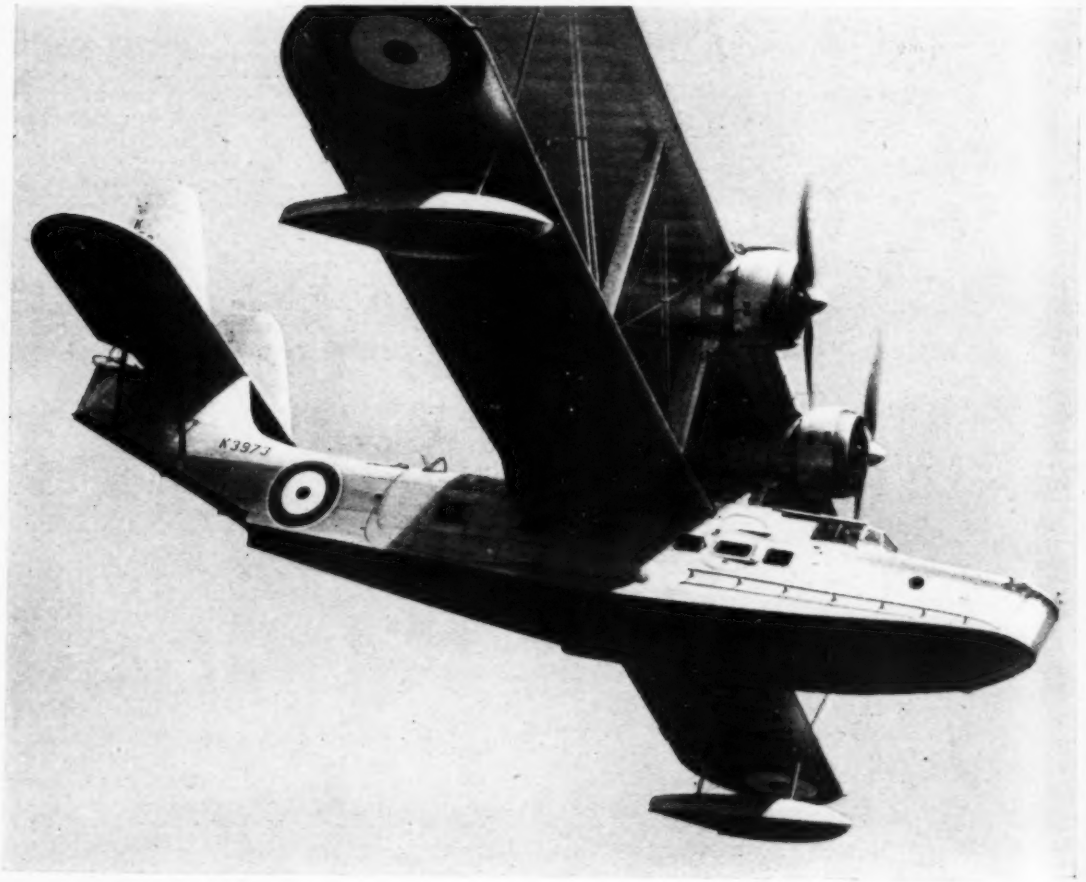
The matter has been brought to a head since the opening of British Scandinavian services. Whereas the booking offices can issue tickets for the foreign companies which operate over this or a similar route, they are not permitted, in their agreement, to do so for the two (soon to be three) companies of our own nationals. These must manage as well as they can with their own connections.

Originally it was always supposed that membership of I.A.T.A. permitted entry into the select circle of those of whom the big travel agencies had "heard," and when the two companies which operate to Scandinavia were elected to the Association everyone imagined that they would automatically join that circle. Not a bit of it.

So far we have not mentioned the quite considerable number of other internal air line companies which are in a similar position. In many ways their losses are even greater, and unless the ban is lifted it would seem, as suggested by a contributor on page 114, that their hope will only lie in active co-operation to the point of running their own air travel agencies. This is an idea which, in any case, has a great deal to recommend it. The majority of people would probably take malicious pleasure in a triumph of the sufferers without help or encouragement from the mighty.

Public Confidence

In the meantime the travelling public must remain largely in ignorance of the services on which they might travel. Even if this public were aware of the existence of such services, it is an undoubted fact that people prefer to carry out all their business of money-changing and ticket-purchasing through one office. The railways can hardly be blamed for watching their own interests by refusing to modify their agreements with the agencies, but the question is: What are their interests? Many people, even in a hard business world, have discovered that it pays to cast one's bread upon the waters. The transport interests concerned are surely big enough to be able to afford to study the comfort and convenience of the travelling public, even at the cost of an extremely slight, and probably temporary, loss of custom. Their future depends upon the confidence of this public.



SEAFARER: The first machines of a batch of Supermarine Stranraer flying boats will soon be seen at Southampton. This is the latest version of the prototype, with 840 h.p. Pegasus Xs in place of the earlier IIIs, and three-bladed Fairey airscrews.

The Outlook

A Running Commentary on Air Topics

The Defence Debate

IT must be admitted that there was much force in the criticism by the leading Opposition speaker in the House of Commons last Monday that the speech of Sir Thomas Inskip, Minister for the Co-ordination of Defence, dealt largely with the supply of shells, guns, aeroplanes, etc., and not at all with co-ordination of defence. It is, in fact, the view of many that there ought to be a separate Minister for Supply of Munitions of War, and that the Minister for Co-ordination should confine his energies to problems of co-ordination. Mr. Lees-Smith, the critic in question, mentioned some of them, notably the fact that, whereas the fighter aircraft and the Observer Corps are under the Air Ministry, the searchlights and anti-aircraft guns are under the War Office; and also that the War Office arranged for Territorial camps, sometimes at dates different from that of the Air Exercises, so that the night operations became of little value.

Another point in this speech was that the danger of hostile bombing may not only drive certain establishments such as Martlesham and Felixstowe away from the east coast (Sir Thomas Inskip stated that the shell-filling factory is being moved from Woolwich to places in Wales, Lancashire, and Scotland), but that the air threat might drive our mercantile shipping in time of war from ports in the Channel to harbours farther away from the Continent, with consequent problems of distribution, and he asked for the Minister's views on that question.

It is certainly to such points that the public—at least the thinking public—expected the Minister for Co-ordination to turn his attention. Undoubtedly, it is very satisfactory to learn of the progress made in arranging for supply, but it is a real danger that, if there is faulty co-operation between our defence forces, the best equipment in the world will not ensure us against "regrettable occurrences."

Returning the Compliment

THERE are probably very few British private owners of aeroplanes who have not, at some time or another, when on tour on the Continent, enjoyed the almost embarrassing hospitality which European flying folk seem to extend as a matter of course. That being so, the decision of the hospitality committee of the Royal Aero Club to try to repay in some small measure the debt which has been gradually accumulating was bound to be welcomed by British aircraft owners and others with pleasant recollections of Continental hospitality. The Week-end Aerien has afforded them an opportunity that might not otherwise have occurred for helping to entertain people with similar interests.

The English summer having fallen this year on one of the Wednesdays in May, it is, perhaps, a good thing that the foreign visitors will not have to do a great deal of cross-country flying during their stay. Short flights to Oxford and Cambridge should be manageable, even in almost Q.B.I. conditions, and the trip by coach to Great Fosters, Windsor and Eton will give the visitors an idea of the road conditions which have done so much to make flying popular in England! It is very fitting that Windsor should be included in the programme, and the visitors will assuredly not forget its close connection with flying *via* the august person of His Majesty the King, our foremost private aeroplane owner.

To the 170-odd foreign visitors who will be arriving at Heston this afternoon *Flight* extends a hearty welcome.

The Flea in a Breeze

FIRST tests of a French *Pou-du-Ciel* have been made in the full-scale wind tunnel at Chalais-Meudon. They have confirmed earlier tests on models and full-scale flying tests, and have shown the *Pou* to be quite stable and controllable, both when flying stalled and at cruising speed. At high speed, however, the tests have shown that an angle can be reached at which the machine goes into a dive from which no recovery is possible. In the wind tunnel the range of angles is, of course, limited, but, translated into free flight, the results are interpreted to mean that, if the machine is dived too steeply, it will become unstable and finish up on its back, no matter what the pilot does with his controls. In the inverted position the machine is said to be stable and impossible to right!

Although it is too early to draw any conclusions from the first tests in the full-scale wind tunnel, the fact that a dangerous attitude has been discovered indicates that one or more remedies must be found if the *Pou* is ever to become the "poor man's aeroplane." The angle of dive at which the instability sets in is such that it would not be reached in normal flight, but might be caused by a very gusty wind, for example. The actual machine used in the tests is one built by Lambert brothers and rigged in accordance with M. Mignet's instructions. It has been flown by several expert *Pou* pilots, including Mignet, and has been passed by them as fit to fly. The trouble, therefore, is one which may be expected to be potentially present in any properly rigged *Pou*. The tests, by the way, have been made in the tunnel with engine running.

In the meantime, M. Mignet is carrying out flying tests with his side-by-side two-seater *Pou*, and has found it perfectly stable. In doing a 'parachute" descent, with the stick right back, no oscillations were present. One does not know, however, how steeply M. Mignet has dived the H.M.18. It is worth recording that the vertical gap between front and rear wing is much greater than in the original single-seater *Pou*, and this may possibly have an important bearing on the diving problem.

Captain of the King's Flight

FLT LT. E. H. FIELDEN, A.F.C., R.A.F.O., has well deserved the honour of being appointed to the King's household with the newly created title of Captain of the King's Flight. He has had most responsible work to do since he went on to the Reserve of Air Force Officers in January, 1929, and he has performed it admirably. The King is known to be, not a reckless man, but a daring one, and he is also a man who always wants to save his time so that he may get more work into the twenty-four hours. Flying has saved him very many hours, and it is easy to imagine that he may often have wanted to hurry when prudence dictated the slower, earth-bound methods of travel. On such occasions, if they ever happened, it would be the duty of his pilot to be both tactful and firm with his 'No.'

That the King has appreciated the services of the man who has always brought him safely through the air, whenever the air was to be trusted, is shown by the appointment of Flt. Lt. Fielden to the newly created post. "Captain of the King's Flight" is a happily chosen title, reminding everyone that King Edward VIII is full of the spirit of the age in which he has begun his reign. It makes one wonder whether before long there will not be a Corps of Air Guards to escort His Majesty when he travels by air on ceremonial occasions.

The winner of the Portsmouth Air Trophy, Mr. Field-Richards (left), with the Trophy, and the entrant, Mr. Walter, who handles the Taylor Cub in this country. (*Flight* photograph)

RACING in

Bad Weather Causes Isle of Wight Race to be Abandoned

Lowe (Comper Swift) at 125.5 m.p.h. Wins from Field-Richards (Taylor Cub)

MORE amazing, perhaps, than the fact that the races were run at all, was that, in weather which was almost universally bad, Portsmouth should have had a temporary spell of fine, though windy weather for the very period during which the Club's annual garden party and race-meeting was being held. During the morning the sky had been overcast with occasional rain, and almost as the last machine crossed the line in the second race clouds rolled over and a fine rain descended, blotting out the South Downs.

The whole affair was miraculous. While the competing machines passed crabwise across the line in the two races and while various heroes demonstrated machines in the prodigious bumps found universally throughout the sky, the guests sat or stood in bright sunshine under a locally cloudless sky; yet, even while the prizes were being presented by Lady Rose, the rain started and those pilots who had imagined that they would return to their respective aerodromes that evening wheeled their machines under cover without great reluctance.

Needless to say, a large number of owners who might otherwise have turned up either failed to appear at all or arrived by more mundane methods. Nevertheless, the environs of the clubhouse and airport building were adequately populated, and the affair can be considered to have been a real success.

There was, in fact, only one serious divergence from the original plan. The thought of the "ultra-lights" crabbing and staggering around the Isle of Wight in a wind gusting up to 45 or 50 m.p.h. was too much for the organisers, who very wisely ordained that this race should be cancelled and that a Portsmouth-Shoreham-Portsmouth race be held in its stead. Save for the perilous passages over the mud and water of Chichester and Langstone Harbours, the competitors were at least flying over dry land. Shoreham's control tower was the easterly turning-point.

In due course, therefore, the Taylor Cub, which had been brought over on the previous day by Mr. Field-Richards, left the aerodrome, as limit man, some ten minutes before F/O. Clouston's Aeronca, and little less than thirty-six minutes before the scratch man, Sir Charles Rose, who was flying his new Vega Gull.

Anyone who has worked out a few simple problems concerning the relative effect of a strong wind over out-and-home courses on different machines will appreciate the difficulties of the handicappers, Messrs. Dancy and Rowarth. Over an out-and-home course of 65 miles the difference between the first and last finishers was only a matter of 4 min. 8 sec., and in the race to follow this difference was to be very much reduced.

Less than twenty minutes after the scratch man had left, three small specks could be seen at intervals beyond the north of Langstone Harbour, and these eventually sorted themselves out into the Taylor Cub, a D.H. Moth, and something which might have been a Swift or an Aeronca—and by that time the bulk of the field was intermittently in sight. The machine which *might* have been an Aeronca was obviously travelling too fast and had overhauled the Cub. Sure enough, a minute later Mr. Lowe's

PORTSMOUTH-SHOREHAM RACE.

Pilot.	Machine.	Handicap Allowance.	Flying Time.	Speed.
		m. s.	m. s.	m.p.h.
1. S. T. Lowe ...	Comper Swift ...	8 32	32 1	125.5
2. Field-Richards.	Taylor Cub	35 57	60 19	66.75
3. Flt. Lt. Williams	D.H. Moth	16 28	40 51	98.5
4. J. V. K. Watson	D.H. Puss Moth .	15 49	33 42	119.25
5. Sir C. Rose ...	Percival Vega Gull	Scr.	25 23	158.25
6. F/O Clouston...	Aeronca	26 15	53 16	75.5
7. C. H. Tutt ...	D.H. Moth	15 14	42 51	93.75

...a GALE

...Abandoned : Modified Race Won by Mr. S. T. ...Portsmouth Air Trophy Won by Mr. ...Cub) at 69 m.p.h.

Mr. S. T. Lowe who, with his Comper Swift, won the Portsmouth-Shoreham-Portsmouth race which replaced the Isle of Wight event. (*Flight* photo raph)

cowled Swift bobbed and crabbed over the line, to win, followed by the Cub and the Club Moth, flown by the instructor, Flt. Lt. Williams, a minute later. The Swift had averaged 125.5 m.p.h., and, more remarkable, the Moth had averaged 98.5 m.p.h.—a speed considerably greater than that of Mr. Tutt's faired single-seater version, which had started more than a minute after it. Half a minute later came Mr. Watson's Germ Oil Puss Moth into

That the high wind and promise of rain did not deter the guests is shown by the extent of the crowd shown in the centre picture (Above) the Monospar is being demonstrated by Mr. Seth-Smith while the interested spectators engulf Mr. Lowe's Swift. (*Flight* photographs.)

fourth place, with the rest of the field at minute intervals.

Before the race for the Portsmouth Air Trophy, spectators watched demonstrations by Mr. Colman with the well-known Envoy, by Mr. Seth-Smith's Monospar, and by Mr. Field-Richard's Cub—watched them, that is to say, at intervals between chasing air-borne buns, plates of bread-and-butter, and hats. Provided that one held on, the tea was excellent and quickly served. During the lulls the labours of an orchestra, too, could be clearly heard and appreciated. The musicians were working enthusiastically in very difficult conditions.

The great point about the second event was that the machines could be seen throughout the race, which was held over a triangular circuit between the railway triangle to the north of the airport, Thorney Island, and the water tower on Hayling Island. However, this irritated the more enthusiastic followers, because the part of the course which was nearest to the airport was far enough away to prevent spectators from discovering which of the two Moths and Swifts were in the lead on each of the three circuits. The irritation is explained by the fact that one of the Moths belonged to the Club and was flown again by the instructor, and that one of the Swifts was owned and flown by Capt. Luxmore, of the P.S.I.O.W.A., and had previously been owned by Mr. Errington, of the Airspeed Company, who is now in South Africa with the Envoys. Very few people know that this Swift was also owned once upon a time by Mr. Alban Ali, and is the heroine of his book, *The Scarlet Angel*. Probably very little of the original *Angel* survives in "—TF."

However, it appeared that the field was holding its original order and closing up in a manner which might result in the perfect line-abreast handicap finish. At the end of the second lap the starting order was still apparently unchanged, but everybody hoped that the faster pilots would be in the picture on the last lap.

PORTSMOUTH AIR TROPHY.

Pilot.	Machine.	Handicap Allowance.	Flying Time.	Speed.
		m. s.	m. s.	m.p.h.
1. Field-Richards.	Taylor Cub	18 5	30 25	69.0
2. F/O Clouston...	Aeronca	14 5	27 4	77.5
3. Flt. Lt. Williams	D.H. Moth	8 2	21 6	99.5
4. C. H. Tutt ...	D.H. Moth	7 42	20 47	101.0
5. F. L. Luxmore	Comper Swift ...	3 46	16 56	124.0
6. Sir C. Rose ...	Percival Vega Gull	Scr.	13 31	155.5
7. J. V. K. Watson	D.H. Puss Moth ...	4 8	17 42	119.5
8. S. T. Lowe ...	Comper Swift ...	3 4	16 39	126.0

The finish, forgetting the winner, who beat the handicappers to the extent of half a minute, was as close as anyone could wish. Over a thirty-five-mile course the whole field arrived under a blanket of one and a quarter minutes, and two pairs of competitors crossed the line within a second of one another. These were the two Moths, Flt. Lt. Williams in the lead, and the Germ Puss Moth, with Mr. Lowe's Swift, in that order. Mr. Field-Richards averaged 69 m.p.h., and the scratch man, Sir Charles Rose, some 155 m.p.h., though he only managed to scrape into sixth position. An intimate knowledge of the district appeared to make all the difference over such a short course. Flt. Lt. Williams just held his lead, and Capt. Luxmore was very little slower than Mr. Lowe, who had given him a start of forty-two seconds

And then the rain.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters intended for publication in these columns.

THE NEW AIR COMBAT

CAPT. NORMAN MACMILLAN'S article on air fighting in last week's issue sets one thinking deeply. Much of what he says is obviously fundamental. It is only in a land campaign that fighter is likely to meet fighter; but if there ever is another land war we must be prepared for a revival of the dog fight. In an air campaign the combats will be between fighter and bomber, and then the dog fight is at least improbable. Even in that case a single bomber may be cut off from its formation and attacked by two or more fighters; in which case one would get a tactical situation not altogether unlike the fight of the Overstrand against the Furies at Hendon, though it may well be that the actual attack of the fighters and the attempts of the bomber to escape will be quite different from what was seen at the display.

The first dictum of Capt. Macmillan which invites discussion is that the fighter's "object is less than half done if he cannot prevent the bomber from reaching his objective." That was not the doctrine expounded by the A.O.C. Fighting Area (Air Marshal Joubert de la Ferté) to Press correspondents at the last Air Exercises. He laid it down that his object was to inflict casualties when and where he could. No one expects or hopes that any one given raid can be prevented from reaching its objective. The object of the fighters must be to stop all raiding in as short a time as possible. The Air Marshal considered a case of an enemy squadron of twelve bombers scheduled to make four raids a week. If his fighters (or guns) could shoot down one bomber on each raid, in three weeks that squadron would have suffered 100 per cent. casualties Even allowing for replacements and reinforcements, it may well be asked how long any raiding force could tolerate casualties on that scale.

Then, coming to Capt. Macmillan's picture of the fight of the future, one would like to ask some questions. Allowing that both fighters and bombers are armed with *canons*, and presuming that the bomber (unwilling to sacrifice bomb load) carries fewer guns than the fighter carries, is it to be supposed that the guns of the fighter will have a longer range than those of the bomber? The answer to that question would obviously be the principal factor governing the tactics of the fighters.

Presuming similar guns on both sides, though with the fighters carrying more of them, one would like to ask Capt. Macmillan why the fighters should not attack the bombers from behind, according to the tactics now (or recently) accepted as correct for Gauntlets. What object is served by attacking from the beam where deflection of fire has its greatest effect? Of course, that drawback would affect both sides equally; but the fighters, having the greater need to inflict casualties, would feel the disadvantage more acutely. Again, why, if the fighters did attack from the beam in line astern, should that force the bombers to adopt a similar formation?

Capt. Macmillan can doubtless give good answers to these questions, but he did not explain his reasons in his article; and I for one should very much like to know his reasons.

London, W.1 TENDERFOOT.

"SQUADRON HERALDRY"

IN connection with your note on "Squadron Heraldry" on page 3 of your issue of July 2, may I point out that it is the shape, and not the number, of the arches on a crown that determines whether it is Imperial or Royal.

Two passages from *The English Regalia and Crown Jewels*, by E. F. Twining, M.B.E., make this quite clear. On page 24, describing the traditional St. Edward's Crown of England, he says, "... the arches are depressed at the centre, this indicating a Royal and not an Imperial Crown." And on page 26, dealing with the Imperial Crown of State, the following occurs: "While following the design of the traditional English Crowns, it assumes the Imperial shape by what are known as Imperial Arches. These arches are not depressed at the centre but slope upwards to the point on intersection."

The Crown used for the new R.A.F. squadron badges follows the latter description and is, therefore, correctly described as an Imperial Crown W. A. REYNOLDS.

London, W.9.

WELCOME TO BRITAIN!

An Aerial Invasion of Heston Next Thursday : Over 100 Continental Private Owners' Machines Arriving for the "Week-end Aerien"

NO fewer than 165 flying enthusiasts from abroad have accepted the invitations of British private owners, extended through the Royal Aero Club, to visit this country by air this coming week-end. It is thus hoped in some measure to reciprocate the hospitality which the British owners have so often received at rallies and other events, and even on private tours, on the Continent.

The list of guests, given below, represents a total of some 111 aircraft, which are due to arrive at Heston to-day, Thursday. Actually, the exact number of visitors is still rather in doubt at the time of going to press. Of the fifteen countries, Germany leads with twenty-five guests, Belgium and France coming second with twenty-one each.

From 4 p.m. to 6 p.m. transport will be available to take the guests to their hotels—Grosvenor House, the May Fair, the Park Lane, or the Savoy. From 7 p.m. to 8 p.m. they will attend a cocktail party at the Royal Aero Club, 119, Piccadilly, at which they will be welcomed by their hosts. To-morrow morning, Friday, the visitors will be split into two parties, who will travel by air to Oxford and Cambridge respectively. Lunch will be taken at Magdalen College and Trinity College.

At Londonderry House

At 10.15 p.m. there will be a reception at Londonderry House, Park Lane, by Lord and Lady Londonderry. At this, as at the other evening functions, dinner jackets will be worn—a sensible arrangement, as will be acknowledged by all owners of small machines who have faced the problem of whether or not to risk writing-off a good suit of "tails" by cramming it into the tiny suitcase which is all their locker will accommodate.

Next day, Saturday, there is a visit by road to Great Fosters, Eton and Windsor, coaches leaving the hotels at 10.30 a.m. Bathing, lunch, tea and appropriately convivial accompaniments are on the programme. A return to Town will be made for the official banquet at Grosvenor House at 9 p.m., when the guests will be received by Sir Philip Sassoon, Under-Secretary of State for Air.

Sunday sees the departure of the visitors from Heston, though the majority, no doubt, will accept the invitation of Mr. Lindsay Everard, M.P., to his aerodrome at Ratcliffe, near Leicester, for lunch.

Thus the programme looks a good one. It only remains to express the hope that the atmospheric conditions change very drastically between the time of writing and next week-end, that we may assure our visitors, with perfectly straight faces, "So, you see, you've been quite mistaken about our British summer."

The Guests, their Countries and Hotels

In the following list, those who are members of parties, probably arriving in the same machine, are coupled by the word "and".

Austria (Savoy Hotel).—Stephan Karpeles-Schenker, Prince Kinsky and another (pilot), Archduke Anton of Habsburg.

Belgium (May Fair Hotel).—René de Caritat de Peruzzis, Pierre Eeman, Lucien Feron and Mme. Feron, Georges Hanet, Guy Hansez and Mme. Hansez, De Keyn and Mme. De Keyn, Maurice de Limelette and Mme. de Limelette, Louis Jean Mahieu and Mme. Mahieu, Jacques Maus and Roger Gillis de Coninck, Gaston A. Roelandts and Mme. Roelandts, Henry E. Rynders, Le Comte Jacques d'Ursel and Baron R. de Vinck de Winnezeele, Pierre Schellekens and Mme. Schellekens, Paul Loicq, Le Notaire Joseph Dupont and Paul Burniat, Edmond Léon and Mrs. P. du Jardin, Paul Beausillon and Mme. Beausillon, Ernest Mantel and Mme. Ernest Mantel, Albert Maréchal, J. M. Provost and Captain Pierre, Robert Jeanty and Mme. Jeanty.

Egypt (Savoy).—Kamal Eloui Bey.

France (May Fair).—C. Delbos, J. Meny and Mme. Meny, Commandant Maurice Patret-Cholley and Camille Marot (pilot), J. Peyrimhoff and Mme. Peyrimhoff, J. Raty and Mme. Raty, Mme. Claire Roman, E. Seligman and Mme. Seligman, André Wateau, Eugene Wattinne and Mme. Wattinne and friend, Paul Blanchet and M. Bosc, M. Fougeret and M. Michel, M. Luc and M. Condoret, A. Neyret and M. de Roux, Marcel Legendre and Mlle. Imbert, Jacques Kellner, Comte du Jonchay and Comtesse du Jonchay, Louis Couhé and Mme. Couhé, François Augustin-Normand, André Jouas and Barnard Rimgeard, Geneviève du Manoir, Mlle. Viviane Elder.

Germany (Grosvenor House).—Erwin Aichele and Frau Aichele, Fraulein Elly Beinhorn, Consul Ernst Farnsteiner and Ernst Gerbrecht, F. Florian, Franz Kirsch and Frau Kirsch, A. Krogman, Dip. Ing. E. Kropf, E. Sheidt, Otto Stinnes, A. Wegenest and Fraulein Wegenest, Hans Mathon, Oberstlieutenant Breithaupt, Carl Goetze, Jr., Dr. Carl Ganser, Leo Lammertz and Frau Lammertz, Johannes Müller, A. von Winterfeldt and Dr. Robert Henschel, Fraulein Ilse Fastenrath, Baron Fritz von Falkenhayn.

Holland (Grosvenor House).—C. Kolff and J. van Stolk and H. M. Schmidt Crans, Mrs. van Heek and H. J. P. van Heek, Mrs. C. J. van Alphen and W. J. van Alphen and D. S. Asjes, M. A. G. van der Leeuw and Mrs. van der Leeuw, J. Heymans and H. S. Heymans, C. E. van t' Groenewout, Jhr. van der Wall Repelaer van Puttershoek, D. H. Reinders, P. A. Wernink.

Hungary (May Fair).—Captain Alexander Magyar and Mrs. Magyar.

Morocco (Park Lane).—Baron M. de Foucancourt and Baronne de Foucancourt and Comte de Guyencourt.

Poland (Park Lane).—Col. Andrej Chramiec and M. Bernard de Skorzewski, Mme. Wanda de Skorzewska and Miezyslaw Grabinski.

Portugal (Park Lane).—Dr. Pequito Rebello and passenger.

Roumania.—Prince Bibesco and Princesse Bibesco (Park Lane), Princess Marina Stirbey (Savoy), Prince Constantin Soutzo (Savoy).

Spain.—Don Antonio de la Questa (Park Lane), Marques de San Joaquin (Savoy), Marques de Mazarredo (Savoy), Vizconde de Manzanera (Park Lane), Senor Ricardo Moroder (Park Lane), Senor Vincente Rios (Park Lane), Aleman y de la Sola and Mme. Aleman de la Sola (residing in London), Senor Ricardo Ruiz Ferry (Park Lane), Senor Luis Ruano (Park Lane), Ivan Pruneda and Captain Morato (Park Lane).

Sweden (Park Lane).—Lt. H. von Schinkell.

Switzerland (at Grosvenor House unless otherwise mentioned).—Col. E. Messner and Captain Rieser, M. Devaud and Lt.-Col. Gerber and Mme. Burgener (May Fair), Major Nabholz and R. Fretz and Mme. Fretz, Capt. Kammacher and M. Tissot and another, Lt. J. R. Pierroz and Mme. Pierroz, S. Baur and two others, F. Meyer and M. Rebsamen, M. Dierauer and Mme. Dierauer, Consul Muller and Mme. Muller, M. Burgener (May Fair), Dr. Clavel.

United States (May Fair).—Miss Bessie Owen and passenger.

Minimising Fire Risk

NOW that air liners are becoming more and more liner-like in regard to luxurious interior fittings and furnishings, new problems present themselves to the constructor who has a conscience in the matter of fire risk. Rather too often does one meet the attitude that a crashed aeroplane, if it burns, makes such an efficient incinerator that the inflammability or otherwise of the cabin interior makes no difference one way or the other. In actual fact, a fraction of a second's respite from the lick of a flame may well be sufficient to enable an occupant to reach and open a door or emergency exit.

Thus, next in importance to the layout of the machine itself from the fire-safety point of view—the positioning of exhaust pipes, electrical gear, possible installation of automatic extinguishing apparatus, etc.—comes this question of cabin equipment.

It is, perhaps, not widely known that asbestos now has a large number of applications in this direction. For example, certain fabric of pleasing appearance is made from that useful mineral fibre. Bell's Asbestos and Engineering Supplies, Ltd., who are specialists in the application of asbestos to fire fighting and heat insulation, offer a range of such fabrics that have already been widely adopted for use in ships, hospitals, schools, etc. Drop curtains of this type are installed in alleyways in the R.M.S. *Empress of Britain*.

Other varieties of the fabric—which is obtainable in a variety of colours to tone with various schemes of decoration—are made for use as tablecloths, carpets, etc.

Full details of these materials—together with suggestions in regard to other uses of asbestos in aircraft construction—are obtainable from the makers at Bestobell Works, Slough, Bucks.

Royal Aero Club F.A.I. Identity Cards

THE Royal Aero Club notifies holders of F.A.I. Identity Cards that Holland has now come into the scheme of reciprocal facilities and as from July 15 holders of the cards are entitled to free landings and free garage for aircraft for a period of forty-eight hours at all Dutch aerodromes.

Members of the Royal Aero Club who have not already done so are recommended to avail themselves of these facilities by applying to the club for this card, which is issued free.

Death of R.Ae.C. Pioneer

FLIGHT regrets to record the death of Mr Ernest Bucknall, who will be remembered by the "old hands" as a great enthusiast among the pioneers. An ardent balloonist, he was one of the founders, in 1901, of the Royal Aero Club, which had its origin in that pastime. For many years afterwards he took an active interest in the club's work, and assisted in the organisation of the early flying meetings. His ballooning adventures included an uncomfortably close approach to the dome of St. Paul's Cathedral, actual contact only being averted by jettisoning a heavy coat on to the roof.

AUGMENTED OUTPUTS

—*Of Bristol Engines and Their B.H.P. : Particulars of New Models for the R.A.F. : New Gun Gear : Controllable Cooling : Sleeve Valve News*

THE vastly improved performance of the latest aircraft adopted for service with the R.A.F. is the outcome of technical advances in a number of directions. Cleaner aerodynamic design, the acceptance of higher wing loadings, slots and flaps, retractable undercarriages and variable-pitch airscrews all contribute to the general elevation. But there is another factor, an intangible one which is not evidenced in the collection of new and experimental aircraft at the R.A.F. Display, and that is the generous power available from contemporary aero-engines.

Not the least remarkable fact is that the greater number of the engines concerned are essentially similar to types which are already established in service. There is no better example of this than that of the Bristol Mercury and Pegasus units, the latest series of which are on order for Service equipment at ratings far is excess of those of present standard models. The margin of improvement in less than two years is of the order of 200 h.p. from both designs. For example, the Gauntlets now in service are fitted with Mercury VIS engines delivering a maximum power of 645 h.p.: the Mercury specified for the Gladiator and Blenheim is giving 840 h.p. Admittedly the height at which this power is obtainable is 1,500 ft. lower than in the former case, but the advance is, nevertheless, truly remarkable. Again, the Pegasus is known to the service with outputs up to 750 h.p. at 4,570 ft.; the Pegasus XX, now on order for machines like the Wellesley, is capable of developing 925 h.p. at 10,000 ft. The take-off power is 830 h.p.

Refinement

Although in capacity and general layout the new engines are similar to the more familiar models bearing the same type name, they incorporate certain refinements which are worthy of special note.

Extended research into the cowling question (a large amount of which has been recorded in *Flight*) has enabled the fins to be made deeper than in the previous series so that with the redesigned cylinder barrels, which have finning of closer pitch, there results an increase in cooling area of over 40 per cent.

The dry-sump lubricating system employed on the new engines follows normal Bristol practice, but now incorporates a device for providing a high initial oil pressure which enables the engines to be opened up to full power in a much shorter space of time than previously.

Two of the accessories which can be supplied with the new engines are of outstanding interest. The first is a device which has been christened the Bristol automatic advance gun gear control and has been introduced in view of the adoption of three-bladed airscrews, higher engine speeds and and an accelerated rate of fire. These innovations necessitate a more flexible type of synchronising control than has hitherto been provided by the fixed type of C.C. gun gear which has been standard equipment in the R.A.F. since the war.

With a three-bladed airscrew the relatively small angle between the blades demands a synchronising device which will automatically adjust the firing period to the airscrew speed and so remove the possibility of damage to the airscrew due to the firing period getting out of phase. And that is where the new gear comes in. It consists of a centrifugal governor which advances the cams as the engine speed increases to counteract the operational lag of the system.

The second device has already been referred to in *Flight*, but has not yet been described in detail. It is the controllable engine cowling which, by limiting the flow of cooling air to necessary proportions under various flight conditions, benefits performance. The cowl maintains uniform cylinder temperatures under all conditions of flight; makes for fuel economy under cruising conditions; provides an adequate control of air flow for ground running and extended taxying under tropical conditions; and, in the event of an engine failure on a multi-engined machine permits increased cooling air to be supplied to the remaining engines which would, of course, be working at higher outputs while the aircraft was travelling at the same, or possibly a lower, speed.

Adjustable Flaps

Essentially, the Bristol controllable cowling takes the form of a series of adjustable flaps round the trailing edge of a long-chord cowling. The principle of actuation of the flaps is an endless Reynolds chain running inside the rear cowl support ring and operating a screw mechanism through sprocket wheels. The gear is irreversible, so flight loads are self-contained. Complete with the rear cowl support ring the device weighs 25 lb. The final drive is suitable for manual, hydraulic or electrical operation.

The possible flap angle range is 0-30 degrees, but this is normally limited to 25 degrees, which represents 2½ revolutions of the driving sprocket.

The following table, in addition to setting out data on the new types of Mercury and Pegasus engines for the R.A.F., gives figures for the Pegasus Xc engine, which is the power plant of the new Short Empire flying boats. The Pegasus Xc is the commercial version of the famous "X." All the engines listed are approved for use with de Havilland controllable-pitch airscrews. The power limits of the Pegasus XX, which, incidentally, has recently completed a highly satisfactory type test, are subject to official confirmation.

Development is still proceeding vigorously at the Bristol works on sleeve-valve engines, and figures for a new Perseus have just come to hand. The engine is designated the Perseus VIII, is moderately supercharged and, like its fellows, is of 1,520 cu. in. capacity. Running on fuel of 87 octane number its maximum output is 810 h.p. at 5,250 ft. and 2,525 r.p.m. For take off at sea level 700 h.p. is available.

	Mercury VIII and IX.	Pegasus X, XI and XII.	Pegasus Xc.	Pegasus XX.
Bore	5¾in. (146 m/m.)	5¾in. (146 m/m.)	5¾in. (146 m/m.)	5¾in. (146 m/m.)
Stroke	6½in. (165 m/m.)	7½in. (190.5 m/m.)	7½in. (190.5 m/m.)	7½in. (190.5 m/m.)
Cubic capacity	1,519 cu. in. (24.8 litres)	1,753 cu. in. (28.7 litres)	1,753 cu. in. (28.7 litres)	1,753 cu. in. (28.7 litres)
Airscrew rotation	L.H. tractor	L.H. tractor	L.H. tractor	L.H. tractor
Airscrew ratio	Merc. VIII 0.572 : 1 Merc. IX 0.500 : 1	Peg. X 0.50 : 1 Peg. XI 0.572 : 1 Peg. XII 0.666 : 1	0.50 : 1	0.50 : 1
Take-off power at maximum take-off r.p.m.	700/730 B.H.P.	920/960 B.H.P.	910 B.H.P.	830 B.H.P.
Maximum take-off r.p.m.	2,650	2,475	2,475	2,475
International rated power	795/825 B.H.P. at 13,000ft. (3,960 m)	810/850 B.H.P. at 4,000ft. (1,220 m.)	740 B.H.P. at 3,500ft. (1,070 m.)	820 B.H.P. at 9,000ft. (2,745 m.)
Maximum climbing r.p.m. (International r.p.m.)	2,650	2,250	2,250	2,250
Maximum power for all-out level flight (5 minutes)	810/840 B.H.P. at 14,000ft. (4,265 metres)	875/915 B.H.P. at 6,250ft. (1,905 metres)	790 B.H.P. at 5,500ft. (1,675 metres)	925 B.H.P. at 10,000ft. (3,050 metres)
Maximum level flight r.p.m. (5 mins.)	2,750	2,600	2,600	2,600
Nett weight to A.M. Schedule E. 124, Issue 3.	980 lbs. (444 kgs.)	1,005 lbs. (456 kgs.)	1,015 lbs. (460 kgs.)	1,015 lbs. (460 kgs.)
Diameter	51.5in. (1.307 metres)	55.3in. (1.405 metres)	55.3in. (1.405 metres)	55.3in. (1.405 metres)

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

THE first entry for the London-Johannesburg race on September 15 has been received by the Royal Aero Club from Mr. Len Oates. The machine is a Percival Mew Gull.

Another interesting entry will be that of the Airspeed Viceroy (two Cheetahs), to be flown by Capt. Max Findlay and Mr. Ken Waller.

The second batch of six of the twelve Miles Hawk Trainers ordered by the Roumanian Government left Reading on Wednesday of last week and arrived safely in Bucarest.

Demonstrations of mid-air refuelling, conducted before officials of Imperial Airways by Sir Alan Cobham at Ford Aerodrome, near Arundel, are understood to have been successful.

Imperial Airways have been notified by the India Office that, for reasons of quarantine, from July 29 air liners will not be allowed to enter India unless a nine-day elapse has occurred from the time they leave Khartoum.

The crack "Richthofen," "Hindenburg" and "Immelman" fighter squadrons of the German Air Force defended Hamburg against raiding forces of light and heavy bombers during manœuvres last week. At one time nearly 100 machines were in the air.

Lord Willingdon has presented a challenge trophy to the Aero Club of India and Burma, for the most meritorious flying performance during each year put up in any part of the world by an Indian national, or any person trained in India and holding a current Indian licence.

PLAN FORM: One of the new Fokker C.X light general purpose biplanes (Rolls Royce Kestrel V) for the Dutch Army Air Service on a quiet, comfortable test flight above typical Netherlands country. These machines do just on 200 m.p.h. and climb to 16,400 ft. in about 10 minutes.

One of the most prominent features of the Empire Exhibition (South Africa) to be held in Johannesburg from September 15 to January 15, will be an exhibit of models illustrating the evolution of the aeroplane.

The actual Percival Gull Six in which Mrs. Mollison broke the out-and-home records will also be displayed. In addition there will be a list, in chronological order, of the pilots, machines, and times concerned with the various England-Africa and Africa-England flights.

A demonstration was given last week of the new civilian gas masks, of which it is intended to manufacture 40,000,000—at a cost of about two shillings each—within the next two or three years.

It is claimed that the masks will give full protection of lungs and eyes against any existing or probable form of gas for five or six hours.

Private owners are invited to make use of the Duke of Richmond and Gordon's private landing ground, South Lodge, Goodwood Park, during the race week, July 28-31.

In order to save time, *Canopus*, the first of the new Short Empire flying boats, is to be returned to the works for furnishing and soundproofing, while the second machine of the series will be submitted for official Felixstowe tests.

CHEATING DAVY JONES: Designed by Mr. Hubert Scott-Paine for R.A.F. rescue and other work, this 64 ft. British Power Boat has a top speed of 35 knots and has accommodation for a crew of eight and four stretcher cases. This remarkable boat, details of which were given in *Flight* of June 11, is powered by three 500 h.p. Power Napier Sea Lions and has a range of 800 miles at cruising speed. (*Flight* photograph.)

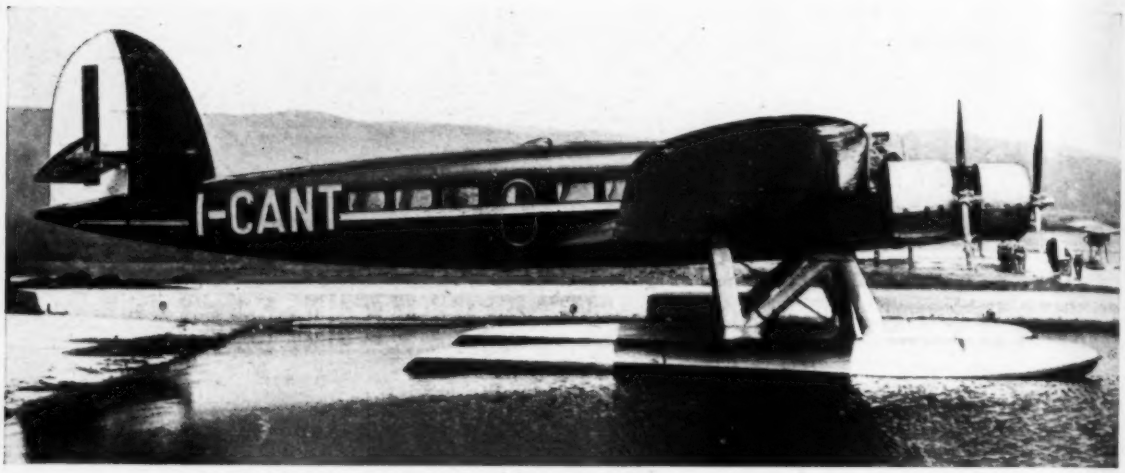
Twenty-five Years Ago

(From "Flight" of July 22, 1911.)

"The new Breguet biplane is built of steel throughout . . . it has a frame built up with pressed-steel channel-section side members just like the chassis of a motor car. . . . Another important feature is the monoplane type of body in conjunction with biplane wings."

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —



UNDULY PESSIMISTIC: Despite the apparent faintheartedness of its registration this new Italian Cant. 606 commercial seaplane has beaten eight international records for speed with load. Twelve passengers are normally accommodated and the maximum speed is something like 200 m.p.h.

THE WEEK AT CROYDON

Flotsam and Jetsam : Visitors—Official and Unofficial : Airship Travel : Seeing the World : Experimental

ONE day last week Capt. Rogers, in command of Imperial Airways *Scylla* on the Paris route, observed what appeared to be a raft formed of three barrels and some sort of black flag on a mast, adrift in the Channel. According to what has become the tradition of the commercial air services, he changed course and descended to 600ft. to obtain a closer view, and then sent out wireless messages, first on normal wavelength and then on 600 metres for shipping. Nobody took any notice, and a ship in the neighbourhood (which may not have had radio) carried on as before.

There seems to be a case here of possible slack watch-keeping both afloat and ashore. Why did his message not receive attention? It seems unlikely, with an expert operator aboard, that something was wrong with his radio. The fact that the raft was actually some Admiralty survey buoy or other drifting menace to shipping has little to do with the matter—though if the Admiralty cannot keep its buoys tethered, you would think they would warn commercial aircraft to look out for them, and no such warnings ever appear to have been issued. One of these days the nautical mind will realise that the aeroplane is of inestimable value in spotting such things.

A registration not often seen here was that of the Danish Air Traffic Company's Fokker F.12, painted bright red, which conveyed Mr. Knud Lybye, managing director of D.D.L., and a party of Danish officials to Croydon on Friday last from Copenhagen. Amongst the passengers on board Oy-Dag, *The Princess Ingrid*, was the Danish Minister of Transport. The party was met by Sir Percy Mackinnon, the chairman of British Continental Airways, Mr. Farey Jones and Mr. Bryans, of the same firm, and Capt. Leverton, of K.L.M. They were then shown the beauties of Croydon by Capt. Morkam, of the Air Ministry, whilst the F.12 left for Gatwick, where the party was to emplane on the next day.

Another interesting visit was paid by Mr. and Mrs. James Haizlip, both pilots of considerable repute in America. They came from Paris in a Beechcraft, for which machine Mr. Haizlip is European agent, and the journey took 1 h. 14 min., despite an unfavourable wind and a detour to make the short sea crossing. When Mr. Haizlip wanted to bring his machine to Europe he found that it was nearly twice as expensive to ship it as deck cargo on a boat as to bring it in the hold of the Zeppelin, so he flew to Lakehurst, sat in the machine with its wings off, and was hauled into the hold, retracting his undercart as he rose. At the other end he went through the same motions in reverse in the hangar at Frankfurt. After that he flew round Europe, and his machine is now at Croydon in charge of Surrey Flying Services, the agents in this country for the Beechcraft. One amusing point he mentioned about airship travel is that while going east they serve three meals a day, but when going west they have to serve four, the days being longer and passengers, consequently, hungrier.

A certain number of movements of personnel are reported amongst Imperial Airways people. Acting Capt. Finnigan left for Karachi on Saturday last and Acting Capt. Oliver left for the same destination on the previous day. Some of the old hands who have been sitting for their first-class navigator's examination have "come out of school" and are back on the air routes, one of them being Capt. Wilkins. The general tendency now is to send people out East for spells of flying boat experience. Capt. O. P. Jones has recently returned from a period of pioneer work on the Khartoum-Kano line, of which one hears very little, probably because it has been run with admirable

regularity. Capt. E. S. J. Alcock is back on leave from the East, and says that he has left his uniform with an uncle, and, though seen on the aerodrome at times, he has the air of one about to dive into any convenient stokehold or cellar if any question of shortage of pilots should suddenly arise.

Full-load tests were made on the new Empire flying boat last week, and, though the take-off time is at present a secret, those in the know are both pleased and astonished. They say the boat has exceeded all expectations. Performance, for once, doth outstrip desire, or very nearly, which must be extremely gratifying for Imperial Airways, who are always being assailed with "the jawbone of an ass" in Parliament and elsewhere.

Lord Swinton recently announced in the House of Lords —and earlier in no less important a place than Gatwick Airport—that civil and military aviation should not be separated, for one experiment had just been completed to meet the requirements of both the military and civil side. He did not mention the number of experiments utterly useless to civil aviation which are being made all the time. Apart from inventing streamlined uniform cap peaks to be used by both military and civil pilots, or methods of saluting with a glowing fag-end concealed behind the thumb, which will benefit both parties, no doubt some such remarkable synchronisation will continue to happen about once a year, and when it does high officials will be suitably thrilled.

A. VIATOR.

North Eastern to Re-open

SOME time next month, depending upon the date when the radio station at Newcastle is in working order, North Eastern Airways will re-open their service to the north of England and, eventually, to Scotland. This, it will be remembered, was closed owing to the difficulty of operating regularly without the help of radio at the northern terminus.

In its new form the service will leave Croydon for Leeds and Newcastle, and, again when radio is available, for Aberdeen, with a possible call at Perth. The time-table will be arranged so that connections can be made with the Continental services at Croydon and with the Orkney and Shetland services at Dyce.

Scottish Enterprise

FOR the first time to our knowledge an air-line operating company has published a complete and well illustrated guide-book covering its routes. Produced for Northern and Scottish Airways, *Go By Air* gives details of the various spots touched by their services in the most interesting manner.

The book covers the features of Cambeltown in the Mull of Kintyre. Skye, Islay, Uist and, of course, the Isle of Man. There is a delightful foreword by the Marquess of Donegall and articles by both Seton Gordon and Sir John Foster Frazer. When an air-line operating company does this sort of thing one can be forgiven for repeating that air travel has arrived.

Wrightway Development

IN *Flight* of July 2 a few brief details were given of the increase of capital in and additions to the board of Wrightways, Ltd., of Croydon. For the moment, the future plans of the company cannot be divulged, but it is good to know that this sound little concern is now firmly on its way to bigger things.

The two additions to the board are Col. the Rt. Hon. Lord Rochdale (father of the Hon. John Kemp, who is chairman) and Major Peter de Havilland, a cousin of the famous aircraft designer and constructor. The capital has been raised from £6,000 to £20,000.

Wrightways already own a D.H. Dragon Rapide, two Dragons and a Leopard, and a very fully equipped D.H.86 will shortly be delivered. Besides such instruments as a Kollsman sensitive altimeter, this machine will have R.T.E. two-way radio and short-wave approach equipment. Messrs. J. W. Duggan and Garnons-Williams are the pilots, and the former, with Mr. G. P. McGiveney, are the operational directors.

Speeding-up in Australia

AUSTRALIAN National Airways, the new £500,000 merger of existing airlines and steamship companies, announces that it will purchase a second Douglas DC-2 to run a daily service on the Sydney-Melbourne-Adelaide route. The probable schedule will be: Leave Sydney at 8 a.m., arrive Melbourne at 10.30 a.m. and Adelaide at 12.30 p.m., returning to Sydney by 5.30 p.m. on the same day. The machine will arrive in Australia in November.

The Adelaide-Perth service is also to be speeded up about the same time. It will then be a one-day service between the two terminals, twice per week each way. This route is now controlled by Adelaide Airways, one of the A.N.A. merger companies, having been recently bought, as announced in *Flight* last week, from that pioneer company, West Australian Airways. All the various merger companies are operating separately at present but come under the unified control of A.N.A. on August 1. Adelaide Airways also increased the frequency of the Melbourne-Adelaide service to a daily one on July 20, and is starting a thrice-weekly between Melbourne, Mildura, Broken Hill and Adelaide.

A Year of R.A.S.

DURING his speech as chairman of Railway Air Services at this company's second annual general meeting, Sir Harold Hartley gave some interesting figures. In the year ending December 31, 1935, 655,972 machine-miles were flown on regular service as compared with the 210,857 machine-miles of the previous year. Some 11,000 more miles are being flown this year every week over services covering five major routes.

Heston Traffic

IN the first six months of 1936 Heston traffic has shown a 24 per cent. increase over the same period last year. 19,900 take-offs or landings, apart from those by school machines, were registered during controlled hours. Customs traffic also shows a very big rise. In the first six months of 1935, 2,956 passengers cleared customs at Heston. In 1936, the comparable figure was 7,072. Jersey Airways carried 3,317 passengers on the London route—a 4 per cent. increase; 1,422 departures or arrivals of air taxis or non-regular air services were registered—an increase of approximately 9 per cent. on last year's taxi traffic. In the same six months, the Airwork service department has put in hand sixty-nine overhauls for C. of A., as compared with fifty-two in the first half of last year.

African Schemes

IN an interview with a correspondent of *The Morning Post* last Sunday, Mr. Pirow, the South African Minister of Defence, outlined a general scheme of an ambitious nature for Africa's air transport connections.

There would eventually be, he is reported to have said, a daily service between Cairo and Nairobi; a twice-weekly service between Khartoum and Nigeria; a thrice-weekly service been Windhoek and Nigeria (with a junction at Bathurst for South American service); a twice-weekly service between the Rand and Windhoek (*via* Bechuanaland); a daily service between Nairobi and Johannesburg; and a bi-weekly service between Salisbury and Beira, linking up with the Imperial Airways east coast flying service.

Simultaneously South Africa's internal air services would be greatly extended. Mr. Pirow said the Union was prepared to co-operate in any services south of the Sahara.

Several of these lines are now being seriously considered by the British Air Ministry, while all will be discussed at the pan-African transportation conference at Johannesburg in September.

Preparing for the Atlantic

ACCORDING to our Irish correspondent, officials of Imperial Airways visited Foynes, Co. Limerick, recently to make arrangements for the reception of the first Transatlantic flying boat, which is expected soon to make the crossing. This machine will be a Martin Clipper, of Pan-American Airways, who, of course, are co-operating with Imperial Airways.

Preliminary arrangements between the two companies and their respective Governments provide for the inauguration within three years of a bi-weekly service between America and Europe. The estimated flying times will be sixteen hours on the eastward trip and twenty-two hours on the flight to America. This year's flight will be experimental; mails will be carried next year; and in 1938 passengers and mails may be transported.

Meanwhile the Secretary of State for Air has announced the details of a five-year agreement concerning the establishment of a service between Bermuda and New York. This service is to be started in the autumn and will be run weekly. The Government of Bermuda will contribute £3,320 of the maximum of £18,100 a year in subsidy.

PEACE or WAR?

The Booking Anomaly as Seen Through the Eyes of an Operator : Some Interesting Facts and a Solution for the Problem

By RICHARD CARVETH

[This article, the opinions in which are not necessarily held by *Flight*, arrived, interestingly enough, after the leader on p. 104 had been written. The ideas expressed and the facts given are sufficiently interesting to merit publication, particularly as the writer, as might be imagined, is intimately concerned with the business of air transport.]

NEITHER public nor private protests have caused the lifting of what can only be called a ban on passenger bookings for many English air lines. This ban is placed by an institution known as the Railway Clearing House, which acts for all the railway companies, and there are those who say that, commercially, it is perfectly fair to cripple the trade of your rivals and that, in any case, it is not a ban.

The Railway Clearing House says, in effect, to all the biggest travel agents, "Book for these new air companies if you like, but you will lose the enormous and valuable railway business you now have." The big agencies thus have the same freedom of action as a man with a highwayman's pistol at his brow. He need not give up his watch and chain unless he wishes to do so. In fact, a visit or a 'phone call to a leading agency in London usually results in a profession of ignorance or lack of interest in certain English firms, but an anxiety to book the passenger by, for instance, Imperial Airways, or by any one of the regular subsidised foreign air lines.

There are routes, notably to Scandinavia, where British air enterprise has been long overdue, but where this summer, thanks to British Airways and British Continental Airways, the civil air ensign is to be seen daily at every airport along the route.

British people would prefer to travel British if they knew that they could do so, but when they enquire they are offered the foreign lines or nothing. If they are knowledgeable folk and press for such travel they are told that nothing can be done about it. One of the air companies thus penalised has Government support in the form of a subsidy and mail contracts, and therefore every passenger deflected from that company is a source of money lost to the taxpayer, for without the big agencies an air travel company can never become self-supporting as things are to-day. The plight of the other company, unsupported by Government, but, nevertheless, playing an important part in the development of British civil aviation, is even worse.

Prestige Abroad

Another point, besides heart-breaking loss of revenue on the Scandinavian and other routes operated by these two British companies, is the loss of prestige all over the Continent occasioned by the fact that British machines run almost empty, whilst those of competing foreigners are fully booked. People on the Continent simply know that even the British do not fly in British machines and conclude that foreign air travel must be superior. Tell the average Dutch, German, Dane or Swede that it is the whole might and power of the collective British railway companies which causes British aeroplanes, even those of a Government-supported company, to fly empty and that it is the same powerful combine which fills foreign aircraft flying from England and see what sort of answer you will get.

So much for Scandinavia. Let us examine another case, that of the North of England service from Liverpool, via Doncaster, to Holland and beyond. For two years, to our national shame, this line, a by no means unimportant one in Air Ministry eyes, has been run exclusively by the pushful Dutch. This year British Continental Airways are running the line on a fifty-fifty basis with K.L.M. Big north of England travel agencies will book for the foreign line, but not for the British, and thus the situation is beyond the wildest dreams of Beachcomber or the rest of the nonsense experts. The same incredible handicap confronts every British air company operating to the Continent, and the embargo holds good also for internal air lines, except, of course, those of Railway Air Services.

The attitude of the railways towards civil aviation is the same as that taken towards another rival form of transport—the road coach. Aviation, potentially, is an even more serious rival to the railways than road transport, and it is difficult to blame them for using tools ready to their hand, to prevent their first-class passengers from being stolen away and placed in luxury coaches or luxuriously appointed air liners.

The rail-versus-road dispute was, however, a family affair, whereas, with aviation, internal routes excepted, the position is very different. It is often asked why the foreign subsidised companies, Air France, K.L.M., D.L.H. and the rest were excepted as well as Imperial Airways, from the embargo. The answer is simple. A number of years ago the Railway Clearing House tried to place the embargo on the foreign companies, forgetting that one end of an air line to the Continent necessarily lies abroad. What would the French, Dutch, German and other governments have done in the way of reprisals if ninety per cent. of the air companies' revenues from England had been suddenly cut off?

At present the position is that the British Government has made no attempt—at least, that anyone has heard of—to change this Gilbertian, and at the same time, tragic state of affairs, and that the Railway Clearing House turns a deaf ear to all appeals. If the Government cannot even protect its "chosen instrument," the subsidised British Airways, it is unlikely to stir a finger on behalf of struggling private enterprise, however deserving.

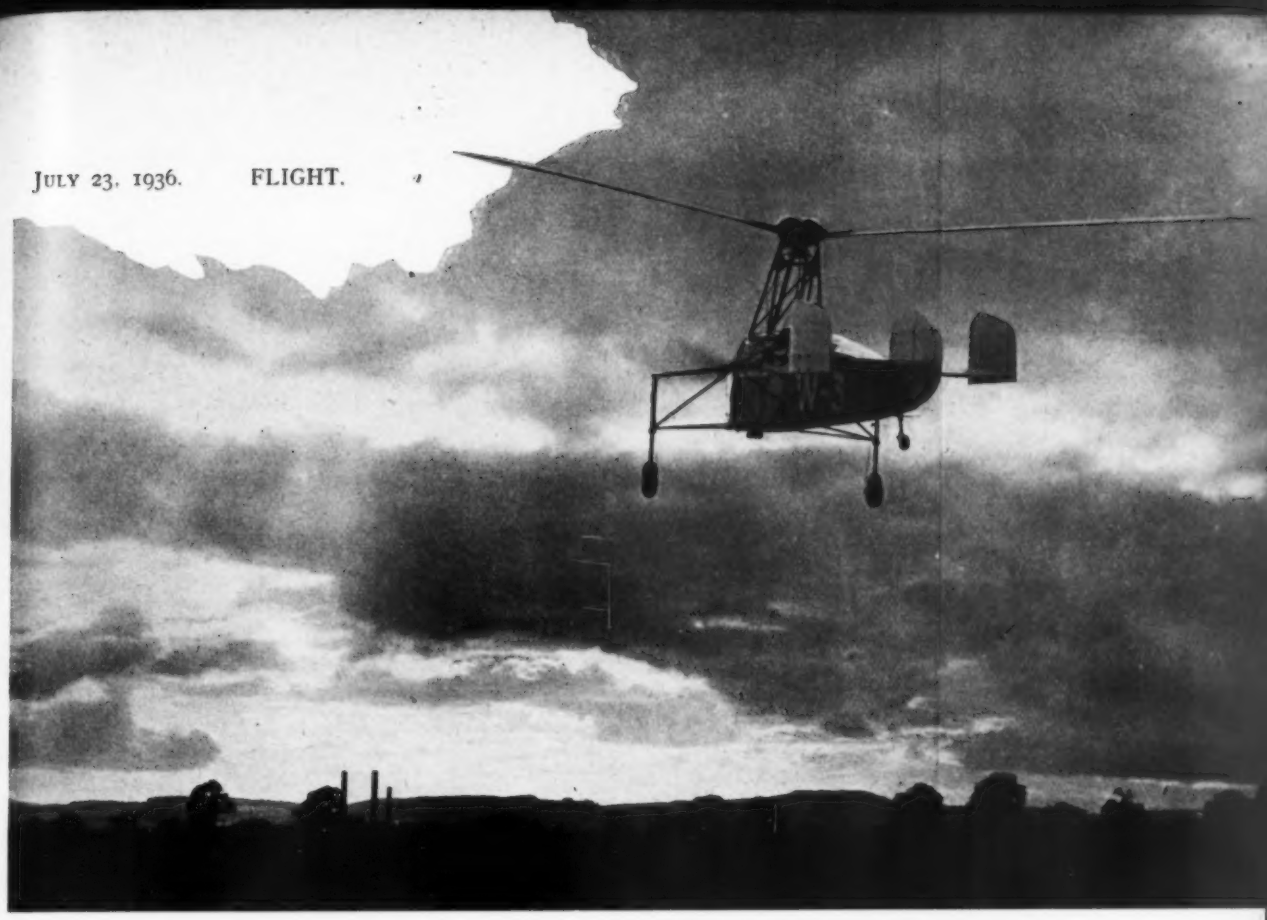
"Air Bookings, Ltd."

There *is* a remedy, of course, but it needs both capital and common sense to bring it into being, and the former is more readily obtainable in aviation than the latter. If all those under the ban combined to form a subsidiary company to book air passages, and if the business were properly organised, the embargo would probably be swiftly broken. Visualise a striking building in the heart of London, run on the very best and most modern lines, not staffed with disgruntled old men or young, flashily dressed clerks, but with brisk young men in the civil aviation type of uniform. It would be open day and night, and an appropriate name for it would be "Air Bookings, Ltd.," which title would be prominently displayed in vividly illuminated lettering. It would do much business after 5.30 or 6 p.m., when the agencies close, and its immense advantage would be that bookings could be made there for all lines, British or foreign, without distinction. It is hard to imagine firms like Imperials, Air France, or K.L.M. refusing to carry passengers taken by "Air Bookings, Ltd.," and there is no doubt that such a central bureau, properly run, would soon become a London air passengers' rendezvous and much valued business would be lost to the leading travel agencies whose remedy would lie in bringing pressure to bear on the Railway Clearing House instead of remaining supine, as at present. Specialisation always pays, and if the efficiency and politeness, for which air transport companies are already famous, were strictly observed in the new booking centre and if, as would be the case, really reliable information and intelligent assistance to travellers were given, such an office would compare very favourably indeed with the average travel agency. War is war, and Railway Clearing House has asked for it and has compelled the agencies to join the combat.

A counter-attack which would have a shattering effect on the enemy would be to offer to book passengers at 7½ per cent. instead of 10 per cent., and at 2½ per cent. instead of 5 per cent. on Empire and Eastern routes. That, and a mere hint that offices would be opened in the provinces quite shortly, would cause the eventual co-operation between rail and air.

The Best of Both

ON July 13, Imperial Airways made a flight which may be the first of a series. A D.H. 86 picked up passengers from the *Queen Mary* at Cherbourg, in the morning and flew, via Paris, Zurich and Vienna, to Budapest. According to *Reuter*, similar connections will be arranged for the *Aquitania* and the *Berengaria* for various other towns in Europe.



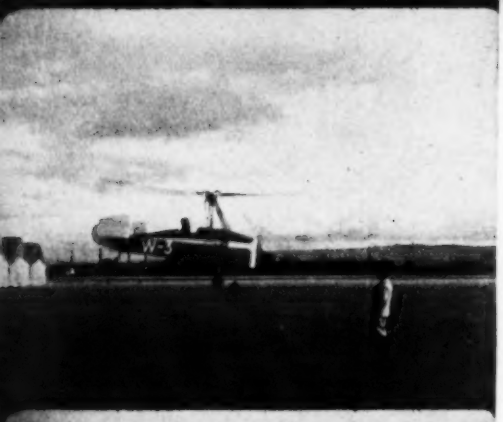
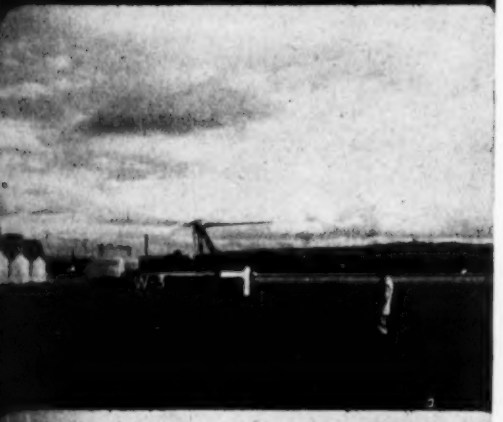
THE NEW AUTOGIROS

Advantages of the "Autodynamic" Rotor Head of New Weir Type : Jump-starts of More Than 20 ft. Altitude : Almost Any Field a "Girodrome"

IT may quite safely be said that no single step in the evolution of the Autogiro has marked such great progress as the introduction of the direct-start, or "jump-start," principle. In Mr. de la Cierva's first British machine, it may be recollected, the rotor was started by hand, a cord being wound around a drum and a number of men "running out" with the rope. The speed thus attained was not great, and it was necessary to taxi around the field for quite a time before the rotor speed was sufficient to lift the machine into the air. The next step was the biplane tail, in which one of the surfaces could be tilted in such a way as to deflect the airscrew slipstream on to the rotor blades and start them moving. This was an improvement in that the pilot was able to start his rotor without outside help, but the rotor speed was still rather low. Then came the introduction of the engine-driven rotor head ; this enabled the rotor to be speeded up to any desired extent, and brought about the possibility of take-offs with very short runs. At the same time, the suppression of fixed wings and the use of direct control of the rotor head was a great improvement.

Last year Mr. de la Cierva announced that he had succeeded in making starts without any forward runs. In his lecture to the Royal Aeronautical Society he disclosed the fact that this was done very simply by merely sloping the hitherto vertical hinges in the blade roots. While the blades were being driven by the engine they lagged behind, and the sloping hinges had the effect of reducing the angle of incidence, so that the rotor could be speeded-up to almost any desired extent within reason. As soon as the drive was removed by declutching, the blades "caught up," and in so doing they increased their angle of incidence. The energy stored in the rotor was very considerable, and was sufficient to lift the whole machine several feet before the rotor had slowed to normal flying speed.

Responsible for the Weir W.3 : from left to right, Mr. G. E. Walker, Mr. F. L. Hodgess, Air Commodore J. G. Weir, Mr. C. G. Pullin, Dr. J. A. J. Bennett ("mathemagician"), and Mr. H. A. Marsh, who has carried out the test flights. (*Flight* photograph.)

"The Cow Jumped Over the Moon." These pictures from a cine film, secured by *Flight's* photographer, show ten stages in the take-off of the new Weir Autogiro. The time-lapse between the first (bottom left) and the last picture is 2¼ seconds. Note that at first the machine rises vertically, and then begins to forge ahead.

A great deal of work was carried out, but the actual progress made was somewhat slow, due mainly to the fact that the great number of variables made a determination of the best combinations extremely difficult. Many months were spent in carrying out mathematical calculations, and it was not until certain parameters had been determined that actual engineering design could really be started.

With the theoretical basis established by mathematics, the Cierva Autogiro Co., Ltd., and G. and J. Weir, Ltd., set to work on the design of new rotor heads, each attacking the problem in its own way, although naturally with very close co-operation. The outcome of all this work is the so-called "autodynamic" rotor head. In earlier types friction dampers were, it may be remembered, incorporated in the blade roots to limit the degree of freedom. In the autodynamic hubs that complication has disappeared, and everything is looked after very neatly by the particular arrangement of hinges and bearings. Owing to patent considerations it is not possible to disclose the exact details at the moment, but the two firms mentioned have evolved rotor heads which are both satisfactory, although they differ in their mechanical interpretation of the same original problems.

A *Demonstration*

To-day (Thursday) the Cierva Autogiro Co., Ltd., and G. and J. Weir, Ltd., are inviting a number of friends to a demonstration of the two new machines incorporating the autodynamic hub. The Cierva machine is virtually a normal C.30 type, with the new head and with two-bladed rotor, while the Weir W.3 is an entirely new single-seater, powered by the new Weir engine described in *Flight* last week.

During a recent visit to the Weir works at Cathcart, Glasgow, we were able to inspect the new Weir engine and the W.3 in which it has been installed, and to obtain the remarkable photographs of the machine with which this article is illustrated. The W.3, it will be seen, is a very diminutive aircraft, and the fact that its rotor has but two blades makes it possible to store the machine in a garage of normal size. Should garage length be an obstacle (the rotor is of 28ft. diameter), it is quite an easy matter to unship one blade, when the machine can be housed in a very small space indeed.

The aircraft part of the W.3 is very simple: a "box"-type wooden fuselage with an undercarriage of very wide track and long travel, a steel tube pyramid carrying the rotor head, and the engine in the nose.

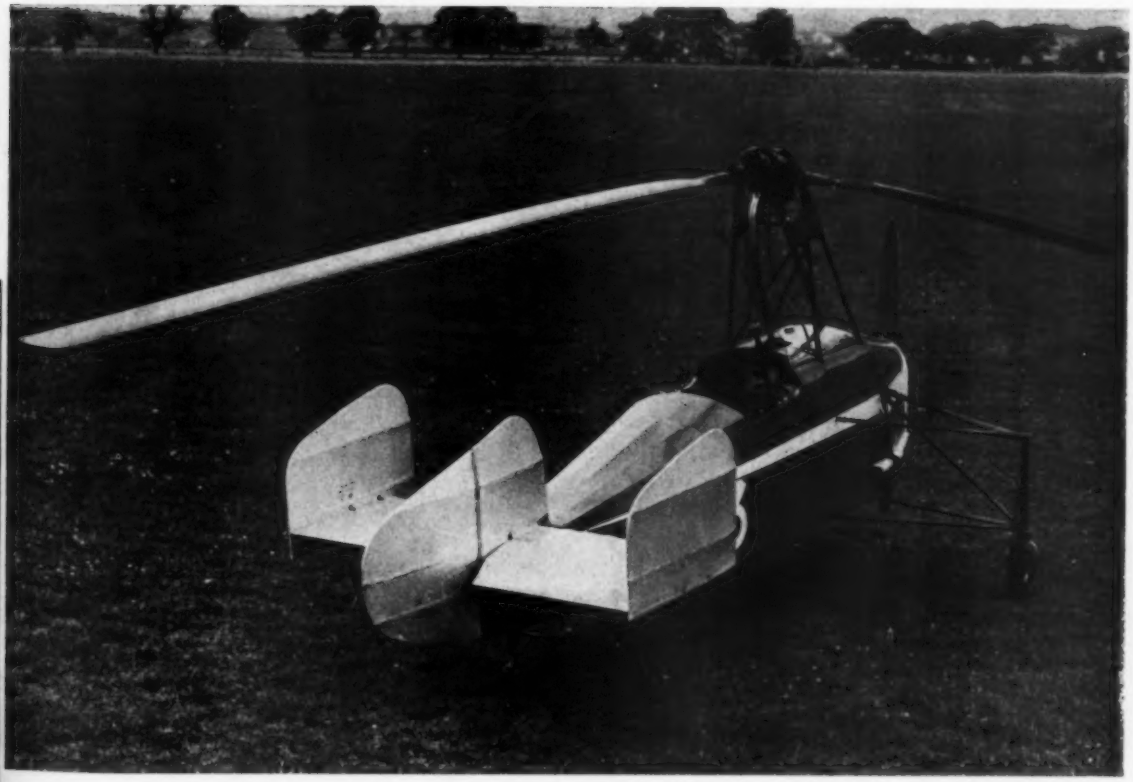
On the morning of *Flight's* visit to Glasgow the W.3 was being transported from the works to the aerodrome at Abbotsinch; this gave the opportunity to see how long it took to attach the rotor blades to the hub. But for the fact that certain adjustments of the pitch angle of the blades were required for test purposes, the mounting of the blades would have occupied a few minutes only. When the machine has gone into production the best angle will have been found and no adjustments will be needed.

Smooth Running

When the engine was run up the first impression was one of a very healthy exhaust note, coupled with very smooth running, and during the subsequent flights by Mr. Marsh this impression was confirmed. The engine undoubtedly runs very sweetly and delivers its power of 45-50 h.p.

Taking off with the ordinary run is, of course, quite possible with the jump-start Autogiro. The rotor is not then run up to such high speed, and the length of run depends upon the percentage of rotor flying speed attained before the wheel brakes are released.

Three vertical fins are used for directional stability. The central rudder is fitted for experimental work only. The picture of the machine on a lorry gives a good idea of the small size. (*Flight* photographs.)



In the " office " of the W.3 : The central stick is the flying control. In the gate on the left, pulling the lever into the first slot engages the rotor head drive, into the middle slot engages the clutch, and into the left slot applies the wheel brakes. All three are released simultaneously by pressing the button on the front of the gate. The rotor brake is operated by the separate lever below the gate. (*Flight* photograph.)

A considerable number of jump-starts were made for the benefit of *Flight's* photographer, and it was noticeable that with each start Mr. Marsh gained extra experience and confidence. Some of the jumps were approximately 20ft. in height, and it was noted that there was then no "sink" when the machine began to gather forward speed. When the rotor was not speeded-up quite so much, the actual jump was perhaps twelve or fourteen feet, and, after passing the peak of the jump, the machine sank slightly until the forward speed was sufficient to enable it to begin its climb.

From the cine film pictures it is possible to form a very good idea of the behaviour of the machine during a jump-start. It might be explained that less than one-third of the pictures actually taken during the particular start are published. Actually, the period of time covered by the pictures shown is 2¼ seconds, the length of film from which the photographs were taken covering thirty-six separate exposures. In that time the machine has reached approximately 20ft., and has begun its horizontal flight, as is shown by the fact that in the last picture it is passing the man standing under it. There was no subsequent "sink."

In another cine film, not published, the operation of the control is seen quite clearly. The stick is held back until the top of the jump is reached; it is then eased forward, and the machine begins to gather headway. The nose-down attitude in some of the pictures is, of course, due to the fact that the c.g. of the machine is slightly ahead of the centre of lift. The speed is not yet sufficient to give the tail surfaces much effect, but as the top of the jump is approached and the path changes from a vertical to a horizontal direction, the horizontal fin area becomes effective and the fuselage again assumes an approximately horizontal attitude.

In the Cockpit

Inside the cockpit of the W.3 are found the usual instruments, plus the controls peculiar to the Autogiro. The stick is double-jointed in order to provide the orthodox pull-to-climb-push-to-dive type of control. With the new rotor head the tendency for the control to become heavy at high speeds has disappeared, and the machine is now very light on the stick at all speeds.

On the left wall of the cockpit are the controls for starting. They have been "gated" to prevent a pilot from making any mistake by forgetting the sequence of operations. Moving the lever into "first" engages the drive from engine to rotor head. Shifting into "second" engages the clutch. This operation must be carried out gently to avoid straining the transmission. When the clutch is fully engaged (with the engine running slowly, of course), shifting into "third" puts the wheel brakes on. The throttle is now slowly opened until the desired rotor speed has been reached. A separate push-button is then pressed, which releases the three engagements simultaneously, and the machine jumps into the air.

On the experimental model the rotor brake is operated by a separate lever. It is possible that this arrangement will be changed in the production machines.

The incidence of the rotor blades depending upon whether they are "lagging behind" or "catching up" with the drive, it is obvious that, if the engine splutters and slows down momentarily during the speeding-up of the rotor, the blades will overrun the drive, and the machine will tend to rise. Actually, this happened once during the demonstration at Abbotsinch, and the machine gave a peculiar "heave," but did not leave the ground, the rotor speed being insufficient. On the production machines some form of stop will be provided to prevent this from happening.

What Will it Cost?

It is understood that a batch of W.3s will be put in hand at once, and that when the accumulated experience with these is available a really large production programme will be embarked upon. The question that will naturally come to mind is "What will the machine cost?" Until some experience has been obtained it is obviously difficult to decide definitely. The £100 autogiro which certain newspapers glibly announced a year or two ago is obviously sheer moonshine. Unless and until the machine is produced at the same rate as one of the popular motor cars, such a price is, of course, quite ridiculous. It is thought, however, that before long it may be possible to buy a W.3 for something in the neighbourhood of £500. Compared with aeroplane prices this cannot be regarded as excessive. It is quite evident that the rotor head of an autogiro, and its drives, etc., is comparable with the gear box and differential of a motor car. Cheapness is not obtained by extreme simplicity in design, but by quantity production. Lord Nuffield did not get the price of his cars down until he began to manufacture in large quantities. While rotor heads are being manufactured by hand, so to speak, they must of necessity be expensive; but if they can be done in hundreds the production cost will tumble down. That, as *Flight* sees it, will be the future history of the Autogiro as far as price is concerned.

A Century

THE two crossings of the South Atlantic made last week (July 13) by the Air France South American mail machines were the 97th and 98th schedule crossings since the inauguration of the all-air service, so that on Monday, July 20, Air France were to celebrate their 100th mail crossing. Last week's mails were carried on the *Ville de Rio de Janeiro* which was making the 51st East to West crossing and the new Farman *Ville de Monte Video* which was making the 47th West to East crossing.

Private Flying

Topics of the Day

Straight Up and Down

IN the mind of the "ordinary person" the ultimate ideal in aircraft is one which will both leave the ground and descend vertically. Pressing button A, the pilot would mount into the sky until such a height had been reached that obstructions would not obstruct; on pressing button B at the end of a journey and immediately over the point selected for parking, the machine would descend liftwise on to the ground. That is very pretty, and a machine capable of such movements would enlarge the aeroplane's sphere of usefulness out of all knowledge.

The latest direct-start Autogiro, described elsewhere, does such things to all intents and purposes in the hands of an expert, but the citizen with both feet firmly planted on the ground must not be permitted to imagine that he can immediately repeat the performance.

So far as the jump is concerned, the pilot's actions are purely mechanical, and are no more difficult than those carried out by a driver when he starts his car, but the business of flying and, more particularly, of making the approach, will still require similar judgment and experience to that applied in normal flying.

New Problems

FURTHERMORE, as any Autogiro pilot will explain, the art of landing with next to no forward velocity requires a new form of technique, and the judgment necessary is at least as great as that in the case of the conventional aeroplane.

Señor Juan de la Cierva is quick to point out that an aircraft of any kind is entirely subject to the movements of the atmosphere, and that all approaches and landings must be made with a knowledge of these movements. Though one's life is certainly not in danger when such an occurrence takes place, an Autogiro can drop almost as firmly out of one's hands on to the deck as any aeroplane. Fortunately, the drop is comparatively slow, is made with the machine more or less in flying position, and can be checked by using the motor, an action which, of course, causes the landing to be made a few yards farther on.

What is even more important, a contact made slightly out of wind can have some very devastating results, for the simple reason that there is little or no forward ground speed to allow the tyres and undercarriage to take up the drift gradually. With any normal machine the slower the landing speed the more marked is the effect of a drift landing.

As far as approaches are concerned, the flatter the glide the more difficult it is to judge the correct moment at which to close the throttle or to make the final turn towards an aerodrome. The Autogiro, therefore, should be the easiest of all machines, particularly since rate of descent and forward velocity can be adjusted over such a wide range.

A Real Step Forward

HAVING thrown the necessary cold water over the heads of those who might whoop too loudly and to the detriment of the future of the direct-start Autogiro, I must say that everyone who has witnessed the machine in real action must have come away with a feeling that flying has made a new start.

Happily for those who enjoy the exercise of a little skill and judgment, there is, as yet, no obvious possibility that anyone and everyone will be rushing about the sky and landing in cabbage-patches or on church steeples (having undershot a cabbage-patch). Training will still be necessary, and those with poor eyesight or very poor judgment will be weeded out—as they ought to be on our roads. But in five years' time the accepted ones will at least be able to use a flying machine as and when it should be used. Not only when the Met. Office has failed to predict a cold front or a thousand square miles of fog and low cloud, and not only when a large space has been laid out in reasonable proximity to the place which one wishes to visit.

The Great Unknown

A WEEK or so ago I found myself cruising over the Cotswolds and Chilterns while on my lawful occasions, and realised how many parts of this England are almost unknown, and, fortunately, unexplored by the passing mass of motorists.

There were quite large villages to be seen which, besides having no railway connection, were reached by roads of the very sub-main variety, and on which not a car could be seen. Villages that were so undisturbed by modern improvements that I automatically throttled back in the hope that they would remain undisturbed.

The whole of the Cotswold area is well worth examination from the cockpit of such a machine as the Swallow, which can drift along on a whiff of throttle at about 50 m.p.h. or glide at 45 m.p.h. with the switches cut and the airscrew stationary.

During the early part of this trip, incidentally, I discovered the extent to which the most casual pilot depends on his compass. In this case, unknown to me, the corrector box had been disturbed, and my course northwards landed me, in less than ten minutes, miles away from my track, and I had covered sixty miles or more before the verge ring had been set so that this track could be held.

If the weather had produced anything more disturbing than one or two mild rainstorms I should have come down to five hundred feet and followed railway lines or roads with my thumb firmly moving along the map. An unhappy method of progress for one who had been brought up to be instrument-conscious to the last degree; to have absolute confidence in a calculated course and ground speed; and to look on the compass as an unfailing guide.

INDICATOR.

Private Flying

FROM the CLUBS

Events and Activity at the Clubs and Schools

LONDON

THE inclemency of the weather limited flying times to 75 hr. 5 min. last week. New members are Mrs. H. Clayton, Messrs. L. Fielden, P. B. N. Davis, R. Henze, Q. Ismail and Mr. and Mrs. Kirkpatrick. The club's new Dragonfly should be available before the end of this week.

REDHILL

Three new members joined last week and 58 hr. 25 min. flying was recorded. Messrs. D. T. Low, J. P. Sargent, R. Everett and D. H. Hallett made their "B" licence night flights.

DONCASTER

During the week ending July 17 Club aircraft flew 29 hr. Mr. E.D. St. John and Mr. F. W. Hudson went solo and Messrs. R. H. Hepworth, T. H. Sessions, C. R. Marshall and Major T. S. Athron became members.

YAPTON

Flying times suffered a little from the high winds but "B" licence members have managed a number of cross countries. Mr. C. Allen and Lt. A. Courtney, R.N., have become members. Flying times for the month to the 17th amounted to 86 hr. 30 min.

READING

Mr. Daffron has become a pupil and Mr. Carpendale has returned to renew his "A" licence. Mrs. Pilleau and Mrs. Sutherland are under instruction for "A" licences. Mr. Von Bleichvoder has taken his "A" licence. Four more Hawk Trainers left for Roumania last week. The flying time at Reading was 49 hr. 50 min.

LEICESTERSHIRE

Owing to staff holidays the Club will be closed for all purposes from August 1 to 10 inclusive. Fifty-six hours' forty minutes' flying was logged for the period July 1-15 in face of bad flying weather. The President, Mr. W. Lindsay Everard, M.P., entertained the officers of No. 504 Squadron to luncheon at Ratcliffe Aerodrome on Sunday, July 12.

YORKSHIRE

Yorkshire Aeroplane Club machines put in 51 hr. 55 min. flying last week. Mr. J. W. Greenwood, of Knaresborough, and Flt. Lt. A. W. S. Matheson of the A.A.F., Yeadon, have joined. Noteworthy among the week's visitors was Mr. Whitney Straight in a Monospar. The interesting event of the week was the wedding of two Club members, Mr. G. E. Platts and Miss J. E. Prince. After the ceremony Mr. and Mrs. Platts flew to Newcastle from Yeadon for their honeymoon.

LEEMING

For the weeks ending July 11 and 18, the flying times of Yorkshire Aviation Services' School were 78 hr. 10 min. and 61 hr. 7 min. Messrs. Fife, Richards, Collins, Littlewood, Fairbank, Young, Stephenson, Sharp, Steel, King-Clarke and Handley became pupils, and new members were Lord Grimthorpe and Messrs. Stephenson, Sharp, Steel, King-Clarke, Bloor, Edwards, Adams, Lax, Dyson, Moncrieff and Willsdon. Messrs. H. L. Sheldrake and Watts have gone solo; Messrs. Lamb and Hardgrave have taken their "A" licences; and Mr. Crichton has passed his height test.

C. A. S. C.

Last Saturday members were on duty at the garden party and races organised by the Portsmouth Aero Club. On Sunday, six hours' flying was logged. Messrs. Hitchins and Gabb have become members on probation.

NEWCASTLE

The appalling weather is reflected in last week's flying times which totalled 49 hr. 25 min. Messrs. R. H. Chapman and H. Souter have become pupils. Among the visitors last week was Mr. Guthrie flying his Vega Gull which won the King's Cup Race. Late entries for the London-Newcastle Air Race will be accepted up to twelve noon on July 29. Details of this race were given in *Flight* of July 9 and 16.

CAMBRIDGE

Fifty-five hours' flying was logged by Marshall's Flying School, the Cambridge Aero Club, and the University Aero Club during the week ending July 19. The wind was so strong on the 14th and 18th that no flying was possible. Four members hope to take their "A" licences as soon as the wind moderates, and Messrs. F. W. Cartwright and L. F. Lyon have joined the School. A member who is taking his "B" licence made an instructional blind flight to Hatfield and back and on the 16th took one of the School Moths to Amsterdam.

BROOKLANDS

Exceptionally bad weather has again curtailed flying times, the figure for last week being 80 hr. 55 min. New members include Mrs. Kendall, Capt. Ramsden (a one-time pilot who has taken to the air again), Messrs. Colby, Cooper, Urlwin-Smith, Hoffman, and Harrison. Mr. E. Russell-Roberts has gone solo. Last Thursday several of the School machines were chartered for a new flying film and carried out all their work to schedule in spite of the weather. It has been decided to send out a monthly bulletin to all full-flying members of the four Clubs setting out forthcoming fixtures. The first Brooklands "Dawn Patrol" of the season will be held on Sunday, July 26, between 8.30 and 9 a.m. Major Thompson, Brooklands' veteran flying member, has recovered from a serious illness and has resumed flying. Messrs. Harley, Hallington, Orton, List and Lovell have bought machines.

CINQUE PORTS

The Marquis of Willingdon, G.C.S.I., G.C.M.G., Lord Warden of the Cinque Ports, has concented to become President of the Cinque Ports Flying Club. Since its inception in 1928, the Club has been privileged to have the Lord Warden as its President. There was comparatively little daylight flying last week due to impossible weather, but three "B" licence candidates managed to get in their night flights. These were Mr. A. Richardson, Mr. S. W. Ogden and Mrs. Macdonald, who has now passed all her "B" licence tests and examinations. The aerobatic flight of three instructors performed for the British Legion at Woodchurch last Saturday and are to give a display for the guests of Miss Jeanne Casalis at her Charity show in Ashford. On Friday the Club's Leopard Moth flew to Frankfurt at the invitation of the Lord Mayor of that town. Miss Clingin has passed her "A" licence tests and Mrs. H. M. Leacock and Messrs. M. Hennessy and A. G. Head have joined the Club.

GARDEN PARTY : Some of the members and guests at Tollerton on July 11 when the Nottingham Flying Club held a garden party.

MIDLAND

Messrs. D. S. Willing, S. Edge, P. D. Parkes and N. R. Gill have joined the Club as flying members. Flying times for the week ending July 17 were 18 hr. 35 min. dual, and 23 hr. 40 min. solo and passenger.

NORTH BRITISH

Visitors and flying hours were few last week on account of the weather. One arrival was Air Vice Marshal Burnett in an R.A.F. Hart Trainer to spend a week-end. Aberdeen Airways are still working at full pressure and at the end of last week made an ambulance trip from Stromness.

LIVERPOOL

Flying times for the month to July 18 aggregate 140 hr. 45 min. Both clubhouses will be open over the August Bank Holiday week-end. Hooton will close on its normal day (Tuesday, August 4) and Speke on the following day. The clubhouse at Hooton will be closed from August 17 to 30 inclusive and that at Speke from August 31 to September 13.

BORDER

The arrival of the new Hornet Moth meant the resumption of flying. News has been received that the engine of "G.M." has been despatched after its "complete" and this machine should be in commission almost immediately. The newly acquired Gipsy II Moth is expected back very soon. The Tipsy monoplane visited Carlisle last week and was demonstrated to, and flown by, members of the Club. It made a very good impression.

HANWORTH

Two non-flying days were recorded last week, but the flying time was 53 hr. 10 min. New members were Mr. Wainwright (National League of Airmen), Mr. M. V. Nutall, and Mr. J. Webber. Mr. Hubbard went solo. The Standard Car Owners Club held a successful rally at the aerodrome last Sunday and occasioned extensive flying. The London Air Park Flying Club has acquired a Leopard Moth which will be available for joy riding and hire.

NORTHAMPTONSHIRE

The Club's latest flying members, Capt. Sir Peter Grant Lawson and Mr. P. Eyton-Williams, managed to squeeze in a little instruction between showers. Major G. R. D. Shaw has bought a Puss Moth from Brooklands. The first of a series of flying visits to other Clubs was to have commenced on Thursday, July 24, when the Club's private owners were to convey associate members, chosen by ballot, to the Leicestershire Aero Club. Messrs. G. and J. Linnell, ever untiring in their efforts to create enthusiasm for aviation, gave a demonstration in their Hornet and Gipsy III Moths at a garden party held in Mr. Swann's grounds at Hardwicke, when over eighty Rotarians were entertained.

SOUTH COAST

His Grace the Duke of Norfolk has kindly consented to become president of the South Coast Flying Club. Strong wind and rain has held up flying during the past fortnight. During the week ending July 12 just over 30 hr. were logged and last Friday 10 hr. were put in. On the evening after the King's Cup eliminating contest Mr. Graham-Head, a member, gave an excellent film show of the International Meeting held a few weeks ago. Mr. Edwards has taken his "A" licence and Mrs. Ansley and Messrs. A. H. Waters, S. W. R. Howell, J. H. Maswell, A. E. Perkins, W. H. Ralph, R. R. Ebbets, Pears, Beadle and Willingham have become members.

HERTS AND ESSEX

The total flying time for June was 401 hr. 39 min., which is 40 hr. better than for June last year. With two machines in the shops and four in service, 225 hr. 30 min. flying was recorded during the fortnight ended July 16. First solos were made by Messrs. T. B. Wood, J. B. Bayas and A. H. Lumden (Air League). Messrs. C. S. Sampson and Homi Chothia completed their tests for the "B" licence. Messrs. A. R. Frogley, M. Espiaube, D. Nock and R. Randall (Club Steward) in a Monospar; G. L. Curtis, Len Walters and F. Morat in a Spartan; and V. A. Ercolani and H. Ellis in an Avian, have returned after a most successful tour on the Belgium Flight. Mrs. G. B. McGinn and Messrs. J. B. Bayas, H. M. Taylor and A. S. Gallimore have become flying members.

NORFOLK AND NORWICH

On Thursday evening, July 16, the Lord Mayor and Lady Mayoress of Norwich with members of the City Council and a number of the Corporation officials, were entertained at the Municipal Aerodrome. They were invited by the President and Directors of the Norfolk and Norwich Aero Club, who received the guests with Lady Holmes. The object of the visit was to give the City Council an opportunity of inspecting personally the airport which the Club manages for them. As the guests were arriving, no less than seven visiting machines landed and later in the evening a further three came, including Mr. M. King, a member of the Club who had just come back from Switzerland in his new B.A. Eagle. Various demonstrations and an aerobatic display were given.

LANCASHIRE

The results of the cross-country competition on July 11, which was detailed in these notes a few weeks ago and commented on by "Indicator" in *Flight* of July 9, were as follows: 1, C. R. Beverley (½ min. error); 2, Sir Kenneth Crossley; 3, Messrs. Ogle and Sykes. All the competitors had a good knowledge of the country, which was valuable in the prevailing bad weather, and only one competitor out of eight entrants turned back. The course was from Woodford to a point near Delamere Forest, to one south-east of Nantwich and back to Woodford—a total of sixty miles. During the party the senior landing competition was won by Mr. G. V. Oddy and the junior by Mr. D. L. Armitage. The arrival competition was won by Sir Kenneth Crossley and the visitors' prize by Mr. Duke-Woolley, from Oxford.

In the Beginning

Airdays, by John F. Leeming (George G. Harrap and Co., Ltd., London. 7s. 6d.).

TO those of us who were in any way connected with the light aeroplane movement in the early days, such a book as *Airdays* is alive with memories, and to those who are new to the flying business it will provide the necessary yet exceedingly amusing education. The club chairman's life in the days of 1925 and 1926 did not consist merely of making bright little speeches on occasion and the director of an air-taxi firm—started years before its time—did not just put his feet on the desk and wait for business to roll up. There was no business.

It would be impossible, in a brief review of this kind, to give any idea of the scope of this book. I saw the glider at Alexandra Park and, before I learnt to fly, enviously watched the work at Woodford with a couple of Cirrus I Moths, so the story of early days of the Lancashire Club was packed with interest for me. But the layest of lay readers will be unable to put *Airdays* on one side, simply because it is so packed with anecdotes. The history of Northern Air Lines should be read by all budding financiers who are now looking at aviation as a "safe bet"; the history of Manchester's airport (the first municipal venture), should be read by all who are a little superior about the fact that Ringway is now replacing Barton; and the whole book should be read by anyone who has second-hand ideas about the character of that father of civil aviation development in this country—the late Sir Sefton Brancker.

The story about the cotton operative who, after a forced landing crack-up on a joyride, refused to leave the ship, even though petrol was pouring from the tank, is worth a great deal. "Together they sprang . . . . to pull the body clear . . . . 'You leave me alone, can't yer? I'm lookin' fer me —— 'at!'" There we have the reason why the north country has been slow to take to the air yet is now becoming one of the most useful areas for air-line operation.

INDICATOR.

Ab Initio in Rure

IT is an undoubted fact that the best and most economical method of learning to fly is to do it, so to speak, in one fell swoop; in other words, to accommodate oneself at or near an aerodrome for the duration. In these circumstances, the pleasanter one's surroundings the better.

Certainly, at the Worcestershire Flying School, near Pershore, the surroundings are very pleasant indeed, and the aerodrome is small enough to ensure that a pupil who is allowed to go solo knows something about approaches as well as landings. At the same time, this aerodrome, save for a few tall trees on the eastern boundary, has safe exits and entries, and, since it is surrounded by fields, there should be little risk in the case of engine failure after the take-off. The dimensions are of the order of 350 and 450 yards. When a member of the staff of *Flight* came in for the first time, the approach had to be made over these trees, with a downhill run at the end, yet the machine pulled up comfortably quite a long way from the boundary without use of the brakes. There is, in fact, a great deal more space than might be imagined after a cursory examination from the air. No marking circle is laid out, but the aerodrome cannot be missed once its position in relation to Pershore and a road-rail crossing have been memorised.

Resident pupils stay at Tilesford House, a sixteenth-century farmhouse lying a few yards up the road, and there, also, is the club, with a lounge, recreation room, and so forth. Though there is no need for the itinerant pupil to join the club, the membership fee is so low that it is difficult to imagine anyone not doing so.

The school owns two Cirrus II Moths, one of which is equipped for instrument flying, and a third Moth is hired for the busy season. The rates are £2 an hour for dual instruction and 30s. an hour for solo, with, of course, reductions for contract flying. As an example, it is interesting to note that a complete "B" licence course can be obtained for £195; a figure which includes the cost of the necessary night flying. F/O. James Bunning, the principal ("father" to his less earnest pupils), has had some eighteen years of flying experience, and possesses, in addition, the necessary ground engineer's licences. Altogether, it is a family affair of the best and most pleasant kind.

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

FIGHTER AND HURDLER: P/O. D. O. Finlay of No. 54 (F) Sqn., Hornchurch, has been made captain of the British Athletic team in the Olympic Games at Berlin. He is here seen coaching the Hornchurch hurdlers.

FLIGHT CHANGES IN HIGHER COMMANDS

The Air Ministry announces the following appointments:—

Air Marshal Sir Arthur Murray Longmore, K.C.B., D.S.O., to be Commandant of the Imperial Defence College on September 1, 1936, vice Major-General R. H. Haining, D.S.O.

Air Marshal Philip Bennet Joubert de la Ferté, C.B., C.M.G., D.S.O., to be Air Officer Commanding-in-Chief, Coastal Command, Royal Air Force, on September 1, 1936, vice Air Marshal Sir Arthur Murray Longmore, K.C.B., D.S.O.

Air Commodore Arthur William Tedder to be Air Officer Commanding, Royal Air Force, Far East, in October, 1936, vice Air Commodore Sydney William Smith, O.B.E.

Air Commodore Roderic Maxwell Hill, M.C., A.F.C., to be Air Officer Commanding, British Forces in Palestine and Transjordan, in August, 1936, vice Air Vice-Marshal Richard Edmund Charles Peirse, D.S.O., A.F.C.

Air Vice-Marshal Peirse will, however, continue for the present as Air Officer Commanding, British Forces in Palestine and Transjordan. Air Commodore R. M. Hill will proceed to Palestine in August with a view to assuming command at a later date.

Air Marshal Sir Arthur M. Longmore was commissioned as a Sub-Lieutenant in the Royal Navy in 1904, and after obtaining the aviators' certificate of the Royal Aero Club, No. 72 of April 25, 1911, joined the Naval Wing of the Royal Flying Corps as a Squadron Commander in 1912. During the war he served with the Royal Navy and the Royal Naval Air Service in France from 1914-1916, and after six months reversion to sea service he re-joined the Royal Naval Air Service. For his services during the war he was awarded the D.S.O. and was mentioned in despatches besides having several foreign orders bestowed upon him. He was appointed C.B. in the New Year's Honours List of 1925, and promoted to K.C.B. in the Birthday Honours of 1935.

After the war, he proceeded to Bulgaria as President of the Inter-Allied Aeronautical Commission of Control, and in 1925 he was appointed Director of Equipment at the Air Ministry; he was then posted to Headquarters, Inland Area, as Chief Staff Officer. In 1929 he became Air Officer Commanding, Royal Air Force, Cranwell, and Commandant of the Royal Air Force College. In February, 1933, he became Air Officer Commanding, Inland Area, and since October, 1934, he has commanded Coastal Area now renamed Coastal Command. He was promoted to his present rank in January, 1935.

Air Marshal Joubert de la Ferté joined the Royal Flying Corps from the Royal Artillery in 1913, having previously obtained the Royal Aero Club's aviators' certificate (No. 280 granted September 3, 1912). During the war he served in France, Egypt and Italy, and was in command of the Royal Air Force in the latter country. For his war services he received the C.M.G. and D.S.O., and was many times mentioned in despatches. He received the C.B. in the Birthday Honours, 1936.

After the war he became an instructor at the Royal Air Force Staff College and also served as Deputy Director of Personnel and Deputy Director of Manning at the Air Ministry. In September, 1926, he was posted for duty as Royal Air Force instructor at the Imperial Defence College and on relinquishing this post in December, 1929, was appointed to Command No. 23 Group, Inland Area, subsequently becoming Commandant of the Staff College in September, 1930.

Since January, 1934, he has commanded Fighting Area, now renamed No. 11 (Fighter) Group. He was promoted to the rank of Air Vice-Marshal on January 1, 1933, and to his present rank on July 1, 1936.

Air Commodore Tedder was commissioned in the Dorset Regiment in 1913 and after graduating as a service pilot in 1916 he served with the Royal Flying Corps in France, where for some months he commanded No. 70 Squadron. After some service in England he proceeded in May, 1918, to Egypt, where he commanded the School of Navigation and Bomb-dropping and No. 38 Training Wing. For his services in Egypt he was twice mentioned in despatches and he also received the Italian Silver Medal in 1917 in respect of his war services. In August, 1919, he was appointed to a permanent commission in the Royal Air Force as Squadron Leader, and received his last promotion to Air Commodore in July, 1934. Air Commodore Tedder has completed courses at the R.N. Staff College and the Imperial Defence College. His Royal Air Force appointments include the command of No. 2 Flying Training School from November, 1924, to January, 1927, Air Staff (Training) duties at the Air Ministry during 1928, and an Instructorship at the Royal Air Force Staff College from January, 1929, to January, 1932, when he was appointed to command the Air Armament School. Since April, 1934, he has been Director of Training at the Air Ministry.

Air Commodore Hill was commissioned in the Royal Fusiliers in 1914, and, in June, 1916, he was appointed to the Royal Flying Corps as a Flying Officer. He served in France during the Great War and for his services he received the M.C. and the A.F.C., besides being mentioned in despatches. A bar to the A.F.C. was awarded him in the New Year Honours, 1922.

Air Commodore Hill was granted a permanent commission in the Royal Air Force, as a Squadron Leader in August, 1919. In 1924, having graduated at the Royal Air Force Staff College, he was employed temporarily on Air Staff Duties at Inland Area Headquarters until posted to the command of No. 45 Squadron in Iraq later in that year. In 1926 he was transferred to the Middle East Command for Technical Staff Duties and returned to the United Kingdom in 1927 to take up an appointment as Instructor at the Royal Air Force Staff College. Since 1932 Air Commodore Hill has been employed as Deputy Director of Repair and Maintenance in the Department of the Air Member for Research and Development at the Air Ministry and in 1934 was appointed an Air Aide-de-Camp to His Majesty the King. He was promoted to Wing Commander in 1925, to Group Captain in 1932, and to his present rank on July 1, 1936.

No. 4 FLYING TRAINING SCHOOL

The undermentioned officer and airman pilots have been awarded special assessments on completion of a course of *ab initio* flying training at No. 4 Flying Training School, Abu Sueir:—

Special Distinction

A.P/O. L. Maxwell-Muller, A/Sergts. Dewell, F. W., Hackney, H. B., Cotton, E., Beck, B.

Distinguished Pass

A/Sergts. Flynn, C. C., Brown, F. S., Goddard, W. B., Fitchew, E. E., May, D.H.

No. 1 FLYING TRAINING SCHOOL

The undermentioned officer has been awarded a special assessment, on completion of a course of *ab initio* flying training at No. 1 Flying Training School, Leuchars:—

Distinguished Pass

Lt. J. M. Brueu, R.N. (Flying Officer, R.A.F.)

SPECIALIST "N" COURSE

The undermentioned officers, having successfully completed the Specialist Navigation Course at the R.A.F. Stations, Calshot and Manston, which terminated on April 18, are entitled to the symbol "N":—Sqn. Ldr. R. L. Ragg, A.F.C., Flt. Lts. F. J. Fressanges, N. C. Ogilvie-Forbes, D. J. Waghorn.

FLYING ACCIDENTS

The Air Ministry regrets to announce that F/O. Kenrick Alan Stewart lost his life in an aircraft accident which occurred at Abuskir, Egypt, on July 13. F/O. Stewart was the pilot and sole occupant of the aircraft.

Also that L.A/C. Frank Innes lost his life and L.A/C. Frederick William Gumb was seriously injured, in an accident which occurred at Theddlethorpe Ranges on July 13, to an aircraft of No. 3 Flying Training School, Grantham, Lincs. L.A/C. Innes was the pilot of the aircraft and L.A/C. Gumb the passenger. L.A/C. Gumb died in the Louth and District Hospital, Lincolnshire, on July 15.

Also that F/O. James Kininmonth Leslie Carstairs lost his life and Flt. Lt. George Douglas Green was severely injured in an aircraft accident which occurred at Marfa Point off Malta on July 15 to an aircraft of the Station Flight, Hal Far. Flt. Lt. Green was the pilot of the aircraft and F/O. Carstairs the passenger.

Also that P/O. Geoffrey Gardner Cornwall lost his life in an accident which occurred at Knotty Green, near Beaconsfield, on July 16, to an aircraft of No. 111 (Fighter) Squadron, Northolt. P/O. Cornwall was the pilot and sole occupant of the aircraft.

Also that F/O. Denis Henry Spencer, of No. 8 (Bomber) Squadron, lost his life in an air accident at Aden on July 18. F/O. Spencer was the pilot and sole occupant of the aircraft.

Also that P/O. Guy Alan Corder lost his life in an accident which occurred at Leuchars on July 20, to an aircraft of No. 1 Flying Training School, Leuchars. P/O. Corder was the pilot and sole occupant of the aircraft.

ROYAL AIR FORCE GAZETTE

London Gazette, July 14, 1936

General Duties Branch

Group Capt. R. Leckie, D.S.O., D.S.C., D.F.C., at present acting as an additional Air Aide-de-Camp to the King is appointed Air Aide-de-Camp to the King, with effect from July 1, 1936, in the vacancy created by the promotion of Air Comdre. Roderic Maxwell Hill, M.C., A.F.C.

Lt. E. J. Boyle (The King's Own Scottish Borderers) is granted a temporary commission as a Flying Officer on being seconded for duty with the Royal Air Force (July 5).

The following are granted short service commissions as Acting Pilot Officers on probation with effect from and seniority of June 29, 1936:—W. W. Campbell, P. F. E. Elstob, R. V. Evers-Swindell, C. L. Haddon, C. E. Harris, G. S. K. Haywood, D. M. Hewson, J. R. Hollington, C. S. Kemp, E. C. Le Mesurier, H. B. Lightoller, E. C. Lilburn, P. W. Lilie, T. D. M. Macdonald, A. D. V. Morum, A. W. Oldroyd, G. W. Parsons, D. G. Perry, H. P. Powell, C. G. S. Robinson, G. A. Roden, H. C. Sammels, B. A. Sisson, G. H. Stephens, E. W. Sykes, C. S. Thomas, P. E. Warne, B. B. Willmott.

The following Pilot Officers on probation are confirmed in rank (March 15):—J. Fulton, J. E. P. Fry.

The following Pilot Officers are promoted to the rank of Flying Officer on the dates stated:—V. H. P. Lynham (June 7); H. M. Styles, D. F. Dixon, D. H. S. Rusher, D. B. Hatfield, and D. H. Lee (June 15).

Sqn. Ldr. J. I. T. Jones, D.S.O., M.C., D.F.C., M.M., is placed on the retired list at his own request (July 9).

The short service commission of Acting Pilot Officer on probation G. E. French is terminated on cessation of duty (July 7).

Accountant Branch

The following Flying Officers are promoted to the rank of Flight Lieutenant (June 3):—H. D. Nicholson, G. E. Shirley, and E. A. Biddle.

Sqn. Ldr. H. G. Bushell resigns his permanent commission and is permitted to retain his rank (March 29). (Substituted for the notification in the *Gazette* of March 31.)

Commissioned Signals Officer

W/O. F. W. Jenkins is granted a permanent commission as a Flying Officer on probation with effect from July 1, and with seniority of March 18.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

Sqn. Ldr. Walter Langston Shaw, M.B.E., is granted a commission as Flight Lieutenant (Hon. Squadron Leader) in Class C (April 1); F/O. J. E. I. Crump is transferred from Class AA (ii) to Class C (June 25).

The following Flying Officers relinquish their commissions on completion of service and are permitted to retain their rank:—R. Reynolds (May 8); A. C. S. Irwin (June 26); G. A. Ogg (June 26).

The following Pilot Officers relinquish their commissions on appointment to short service commissions in the Royal Air Force (June 29):—D. G. Perry, C. S. Thomas.

ROYAL AIR FORCE SPECIAL RESERVE

General Duties Branch

J. R. Garrett is granted a commission as Pilot Officer on probation (June 12).

AUXILIARY AIR FORCE

General Duties Branch

No. 603 (CITY OF EDINBURGH) (BOMBER) SQUADRON.—P/O. F. W. Rushmer is promoted to the rank of Flying Officer (April 19).

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Air Commodore.—G. R. Bromet, D.S.O., O.B.E., to Headquarters, Coastal Command, Lee-on-the-Solent; on appointment as Senior Air Staff Officer vice Air Comdre. N. J. Gill, C.B., C.B.E., M.C., 30.6.36.

Group Captain.—Sir C. J. Q. Brand, K.B.E., D.S.O., M.C., D.F.C., to Dept. of A.M.R.D., Air Ministry; on appointment as Deputy Director of Repair and Maintenance vice Air Comdre. R. M. Hill, M.C., A.F.C., A.D.C., 11.7.36.

Squadron Leaders.—T. J. Desmond, to Headquarters, No. 22 (Army Co-operation) Group, South Farnborough; for Armament duties, 7.7.36. E. J. Ffoulkes-Jones, to No. 1 Flying Training School, Leuchars; for flying duties vice Sqn. Ldr. T. A. Warne-Browne, D.S.C., 5.7.36. R. Grice, D.F.C., to Headquarters, No. 11 (F) Group, Uxbridge; for Air Staff duties, 7.7.36. J. H. Hargroves, to No. 214 (B) Squadron, Andover; for flying duties, 4.6.36. J. C. Brooke, D.S.C., to H.M.S. *Courageous*; for Engineer duties vice Sqn. Ldr. T. O. Clogstoun, 6.7.36. W. E. Dipple, to No. 49 (B) Squadron, Bircham Newton; to command, 6.7.36.

Flight Lieutenants.—F. Porter, to Headquarters, No. 2 (B) Group, Abingdon, 6.7.36. C. W. L. Trusk, A.F.C., to R.A.F. Depot, Uxbridge, 6.7.36. E. M. Donaldson, to No. 1 (F) Squadron, Tangmere, 2.7.36. J. Goodhart, to No. 1 Armament Training Camp, Catfoss, 5.7.36. N. A. R. Halliday, to No. 1 Armament Training Camp, Catfoss, 5.7.36. D. I. P. Macnair, to R.A.F. Station, Aldergrove, 5.7.36. D. W. R. Ryley, to Air Armament School, Eastchurch, 5.7.36.

The undermentioned are posted to the Air Armament School, Eastchurch, with effect from 6.7.36:—E. G. Granville, J. M. Warfield, M. H. Dwyer, W. N. Elwy-Jones, G. P. Macdonald, A. M. Bowman, B. A. J. Crummy, R. A. R. Rae, W. P. J. Thomson, and and G. C. Stemp. D. McD. Fenton, to No. 15 (B) Squadron, Abingdon, 9.7.36.

Flying Officers.—W. A. K. Igoe, to No. 23 (F) Squadron, Biggin Hill, 10.7.36. J. S. O'Brien, to No. 23 (F) Squadron, Biggin Hill, 9.7.36. F. W. Dixon-Wright, to No. 2 Armament Training Camp, North Coates Fitties, 5.7.36. C. J. Giles, to No. 2 Armament Training Camp, North Coates Fitties, 5.7.36. T. G. L. Gale, to Home Aircraft Depot, Henlow, 4.7.36. G. W. Heather, L. Coulson, W. R. Brotherhood, E. B. C. Davies, C. F. S. Fraser, A. Golding, C. R. D. L. Lloyd, G. E. Macdonald, S. P. A. Patmore, H. W. Dean, and H. R. Allen.

Pilot Officer.—A. W. J. Clark, to No. 821 (F.S.R.) Squadron, 8.7.36.

Acting Pilot Officers.—The undermentioned are posted to the Royal Air Force Depot, Uxbridge, on appointment to hort service commissions as Acting Pilot Officers on probation with effect from 29.6.36:—W. W. Campbell, P. F. E. Elstob, R. V. Evers-Swindell, C. L. Haddon, C. E. Harris, G. S. K. Hatwood, D. M. Hewson, J. R. Hollington, C. S. Kemp, E. C. Le Mesurier, H. B. Lightoller, E. C. Lilburn, P. W. Lillie, T. D. M. Macdonald, A. D. V. Morum, A. W. Oldroyd, G. W. Parsons, D. G. Perry, H. P. P well, C. G. S. Robinson, G. A. Roden, H. C. Sammels, B. A. Sisson, G. H. Stephens, E. M. Sykes, C. S. Thomas, P. E. Warne, and B. B. Willmott.

Medical Branch

Group Captain.—R. H. Knowles, to R.A.F. Depot, Uxbridge, for duty as Senior Medical Officer and Officer Commanding Hosp'tal, 9.7.36.

Wing Commander.—V. R Smith, to Superintendent of the Reserve, Hendon; for duty as Senior Medical Officer, 14.7 36.

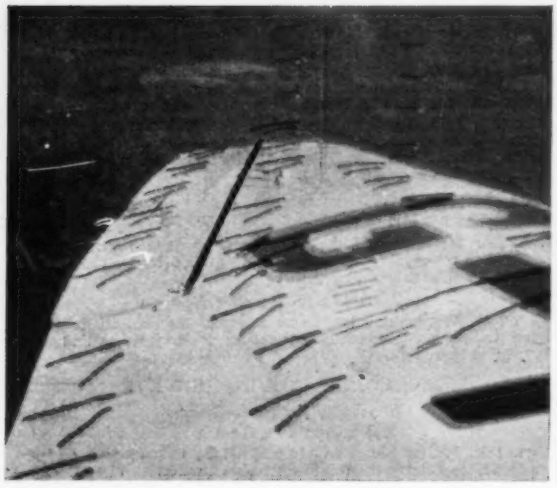
Flight Lieutenants.—J. M. Ritchie, to No. 9 Flying Training School, Thornaby, 8.7.36. C. Crowley, to Air Armament School, Eastchurch, 9.7.36.

Flying Officers.—W. J. L. Dean, to Home Aircraft Depot, Henlow, 7.7.36. D W. I. Thomas, to Medical Training Depot, Halton, 1.7.36.

MORE FULL-SCALE STALLING

Part II.—Confirmation of Theory on Other Machines

By W. E. GRAY



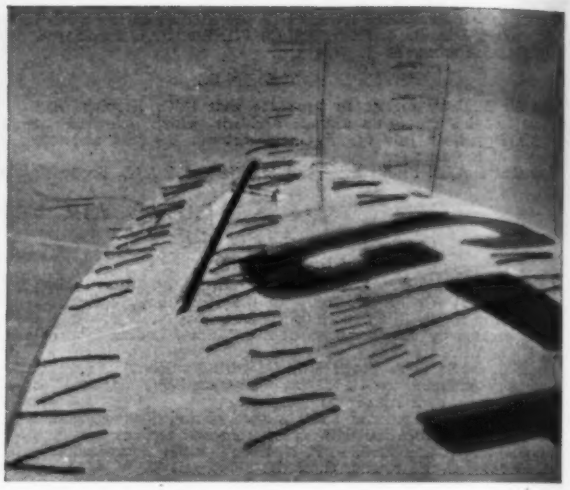


Fig. 1 : The test on the Monospar : superimposed photographs of the wool-tufts at 70 m.p.h. in (a) straight flight and (b) with 20 deg. yaw forward. Fig. 2 : Superimposed photographs at 75 m.p.h. showing sideslip in the opposite direction.

IN last week's article (pages 94-96) an account was given of the preliminary wind-tunnel and full-scale work on the stalling of tapered wings, and an attempt will now be made to describe the further ground that has been covered in the past week. It may be said at once that the main evidence is now complete, and, in the writer's opinion, conclusive; it has been established that a straight T.E. gives a straight flow right up to the stall and that a back-swept T.E. gives an outward surface flow; the evidence is not pictorially available at the moment in support of the latter statement, but it is hoped to give it in the near future.

The film of the Swallow tests, referred to last week, has now been viewed in motion and in fairly detailed examination: the ultimate "front stall" has not come out well, as had been hoped; the layer of deflected air is very clearly shown, with the upper flow passing over it; the side flow towards the tip when the wing is the down-wind one in a yaw is also well recorded, the flow ultimately driving along the wing and stalling the tip, as had been visualised when the "theory" was first evolved. As the film was taken at some sixteen exposures per second, it is not possible to run it slowly, so it needs a quick eye to detect all the details, and there has not been time yet to study it fully as "stills."

Swept-back Wings

The most important of the new tests is on a swept-back wing. An untwisted wing of this type is rare or unknown in this country, and the writer is indebted to the sportsmanship of Herr Pabelick, who studied the angle of the flow on his Bücker Jungmann, at Heston. The sweepback is 12 deg. approx. and the machine an untapered biplane with some 16 deg. stagger and rounded tips. At a speed of 70 km./hr.—about its stalling speed—the outflow near the T.E. at about one-third along the semi span of the lower wing was approximately 3.5 to 4 deg.; near the wing tip it was considerably more. This was a visual test by Herr Pabelick; the machine was carrying luggage and there was not time to unpack it to take photographs, but he has promised to take the writer up for photos and films on his return in a few days' time.

The flow was also studied in an impromptu test on a D.H. Dragonfly, but the photographs are not good enough for reproduction. Wool strands on the lower wing (no sweeping of T.E.) showed the flow to be straight right up to the stall, but one strand near the tip where the T.E. begins to sweep forward showed, as expected, definite inflow, increasing with incidence.

The Monospar

A number of photographs and many ciné shots have now been taken on a small Monospar. Although the sweepforward of the T.E. on the outer part of the wing is some 16 deg., the bending of the flow in straight flight is less noticeable than on the Swallow; this is probably due to the somewhat reflexed T.E. In Fig. 1 are shown, superimposed, the flows at 70 m.p.h for straight flight and with 20 deg. yaw towards the wing tip (tip forward); it is difficult to allow for perspective, and this method makes it clearer; it will be noticed that the flow near the T.E. has been bent inward some 50 or 60 deg. on the inner part of the wing by the 20 deg. yaw. Fig. 2 shows a corresponding pair of photos at 75 m.p.h. for sideslip the other way, and it will be seen that the alteration is rather less; had the sideslip exceeded the sweepforward of the T.E. by more than the 4 deg. the change would probably have been accentuated. It should be noted that there is a balance tab half-way out the aileron, which upsets the flow there. In another photograph, not reproduced, of the flow at 60 m.p.h. just before touching ground, the flow along the T.E. is more noticeably inward than at 70 m.p.h. The wool used in these tests is much thicker than in the previous Swallow tests, so as to make the ciné films clearer, but it is rather stiff. The two photographs of the Swallow wing, with 20 deg. yaw right and left, printed last week, are very interesting if superimposed; the forward strands diverge at 40 deg., but as the T.E. is approached the angle rapidly widens, especially over the inboard part of the wing. If the corresponding photographs of the Monospar are superimposed the widening is nearly as pronounced on the second row of strands

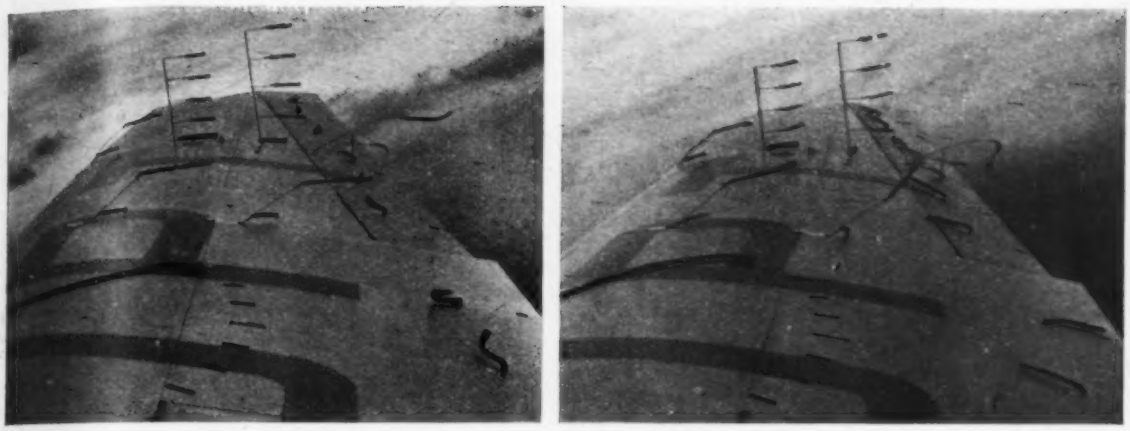


Fig. 3: On the B.A. Swallow at 35 m.p.h.: masts carrying wool-tufts to indicate downwash at 35 deg. yaw and (Fig. 4) 45 deg. yaw. In the foreground is the author's graduated wool-tuft "yaw-meter."

as on the rear row, due, apparently, to the reduced T.E.

The cinematograph film of the Monospar flow shows up the inward bending of the surface flow rather more than do the still photographs, and shows very graphically the flow in a straight stall; when the flow over the rear part of the wing inboard of the aileron is quite stalled and all the outer part of the wing is still unstalled there is still a pronounced inflow over the aileron. In a sideslip of 20 or 30 deg. the stall on the down-wind tip begins all along the T.E. and aileron at about the same time, while on the up-wind tip the flow is bent inward very much, as on the Swallow.

Referring again to the further tests on the Swallow, it was found difficult to hold a sideslip at an adequate angle and a low enough speed to cause the down-wind wing tip to stall first, partly perhaps because the fuselage wake in a sideslip blankets the inner part of the wing. Two interesting flow photographs are shown, however, in Figs. 3 and 4, the speed in each case being approximately 35 m.p.h.; masts with wool were mounted on the wing to study the downwash over it. Fig. 3 shows the downwash well maintained, although the surface flow over the aileron is outward along it (zeros have been provided for the T.E. strands); the angle of yaw is about 35 deg. and it will be seen that the stick had to be well over to hold the attitude. In Fig. 4 it shown a yaw of over 45 deg. and it will be seen that the flow over the aileron is now outward and forward, and although the flow is steady almost to the end of the "yaw-meter" wool the flow has broken down in the plane of the masts and the downwash angle has changed completely; superimposing the negatives shows a change of some 10 deg. at the tops of the masts and considerably more lower down.

The writer hopes to be able to give photographs of the Bücker tests in a future issue, and perhaps results on other machines also, so as to make the pictorial evidence complete.

Incidentally, it is desired to correct two printer's errors, and one of the writer's, in last week's article: the infinite aspect ratio tunnel test was at a yaw of 10 deg., not 100 deg., and the sweepback of the Swallow L.E. was given as 3 per cent. instead of 3 deg.; the lengths of the wool strands along the aileron can be seen in the photos to be not uniform, as was stated, although in the rush of the work it was thought that they had been made so; the writer apologises to readers for this mistake.

A "Pneumatic" Merger

WITH a view to enlarging the scope of the respective businesses, a merger of interests has been concluded between the well-known engineering firms of Broom and Wade, Ltd., of High Wycombe, and B.E.N. Patents, Ltd., of Park Royal, London.

The former company manufactures a complete range of portable and stationary air compressors and pneumatic tools, while the products of the latter include a range of small air compressors, paint-spray and garage equipment.

Apart from a further interchange of directors, the management and affairs of the two companies will continue as before.

Aviation "Spirit" With a Difference

FLT. LT. TOMMY ROSE is joining Britain's select little band of business representatives who use aeroplanes for their work. He is not, however, "travelling in" anything so mundane as sparking plugs or oil, though it would be accurate to describe his new line as "a popular brand of aviation 'spirit' marketed in bottles but so far unobtainable from the pump."

These facts were gleaned from Flt. Lt. Rose when we cornered him at a cheery affair down Deptford way on Wednesday of last week, where Mrs. Amy Mollison opened the new warehouses of Seager, Evans and Co., Ltd., of gin and cocktail fame. This distillery, actually, will be the source of the "aviation spirit" which, with the aid of a Miles Falcon, Flt. Lt. Rose will introduce to the clubs and other places where flying folk congregate.

Aviation Developments, Ltd.

AN interesting development in the aviation world is the news that an old-established firm of motor accessory and equipment factors, Johnson's (of Godalming), Argyle House, 29-31, Euston Road, London, N.W.1, have now entirely reorganised their business, forming a new company especially to concentrate on aeronautical work; its title is "Aviation Developments, Limited." As a nucleus the company has secured the British Empire rights on a number of aircraft and allied patents, among which are the Chobert automatic riveting system.

The chairman of directors is Sir Alliott Verdon-Roe, whose name needs no introduction to readers of *Flight*, while the managing director is Mr. Stanley T. Johnson, himself an enthusiastic flying man. The technical director is Group Capt. Vere Bettington, C.M.G., J.P., who is well known as a consultant to a number of important aviation interests. The fourth director is Mr. David Orr, a member of the London Stock Exchange and a specialist in aviation matters.

As consulting engineer the company has secured the services of Group Capt. W. Harold Primrose, D.F.C., A.M.Ae.S.I., who was, until recently, technical adviser on aeronautical matters to the Postmaster-General, and is now acting as independent consultant to numerous important transportation and manufacturing organisations.

Joint consulting engineer with Group Capt. Primrose is Mr. T. C. L. Westbrook, general manager to the Supermarine Aviation Works, where the Chobert riveting system is being used under licence. As technical adviser and general sales manager, the services of Mr. Alvin E. Loe have been retained.

LE BOURGET'S BIG DAY

The Second Annual Fête de l'Air : Not on the Hendon Scale

AT the recent French National Aviation Meeting, or the Fête de l'Air, as it is known colloquially, the high lights were manœuvres by fighter squadrons, individual and collective parachute jumping, and displays of new types of civil and military aircraft.

The first main event was a demonstration of tactical evolutions and aerobatics by Dewoitine 500 fighters (690 h.p. Hispano Suiza X engine) belonging to the 42nd Rheims Aviation Regiment. Then a Caudron towed a glider aloft and cast it off, leaving it to float down through the clouds. A small Zodiac observation balloon of 800 cubic metres capacity and fitted with a 60 h.p. Salmson engine circled the aerodrome.

At 2 o'clock Governor-General Cayla of Madagascar, accompanied by Rene Lefevre, the trans-Atlantic pilot, landed in a Breguet 27 after a tour of the Mediterranean.

M. Albert Lebrun, President of the French Republic, arrived at 2.30 and was received by M. Pierre Cot, the Air Minister, Marshal Petain and General Fequant, Chief of the Air Force.

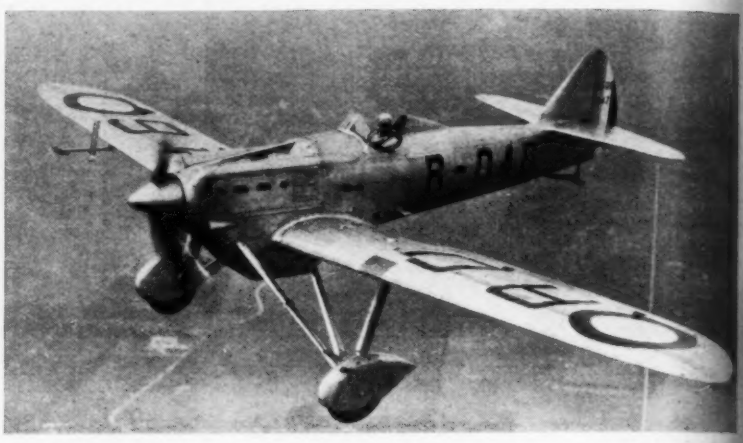
Parachute jumping followed, and then a group of two dozen Morane Saulnier parasol monoplane fighters aerobatted and formated. Their precision was particularly notable.

Marcel Doret (Dewoitine) and Detroyat (Morane) obliged with aerobatic displays and evoked great applause.

Five Liorè et Olivier heavy bombers each bore three parachutists over the aerodrome and dumped them in unison.

Radio-directed manœuvres by a Dewoitine squadron went over well as did Detroyat's presentation of the ham-fisted tyro act. His faults were pointed out by wireless. Later, in the parade of new machines, which included the Nieuport 160 fighter, Bloch 210 bomber, and Farman 221 four-engined bomber, Detroyat took over the new Morane Saulnier 405 fighter, with the very latest Hispano Y cannon engine.

Aerobatics by the popular Etampes squadron and a presentation of new civil types completed the show.



A Dewoitine D.500 fighter (690 h.p. Hispano Suiza X engine) ; a type which figured prominently at the Le Bourget Meeting. This machine, and a similar type with 860 h.p. Hispano Y cannon engine, are the latest standard equipment of French fighter squadrons. The D.500 is capable of 231 m.p.h. at 15,580 ft. and is armed with two machine guns.

MORE JUMPS : A vertical take-off by the latest C.30 Autogiro. Various components of this experimental machine are heavier than they need be, with the result that the gross weight is the same as that of the ordinary C.30 fully loaded. In spite of this, jumps of forty feet in height have been made. An article on the contemporary Weir Autogiro is published on the centre pages of this issue. (*Flight* photographs.)

A Baffin on the Bows

THAT the Blackburn Baffin which crashed on the bows of the French liner *Normandie* was valued at £7,000 (but only £1,000 *after* the accident) was disclosed at the court-martial of the pilot, F/O. G. K. Horsey (Lt., R.N.) last Monday and Tuesday.

One lighter moment occurred during the hearing, when a witness said, "I heard not so much a crash as a terrible noise of tearing and rending. When I went out of the chart room the 'plane had just landed."

"We don't call that landing," commented Sqn. Ldr. J. B. Walmsley (prosecuting).

F/O. Horsey, in his evidence, said that after dropping a practice torpedo he found himself getting close to the *Normandie*, and had no room to get across her bows; he therefore flew along her port side. He was also endeavouring to avoid flying over a nearby measured mile of which he had been warned to keep clear. His engine at this moment started to fail, and he decided that he would have to descend in the sea. He tried to turn away from the ship in order to do so, but found his machine being moved in bodily sideways towards her.

The case concluded on Tuesday evening, when it was stated the findings would be promulgated.

Tyres in the King's Cup Race

IT is interesting to recall that six of the aeroplanes in the final of the King's Cup race were fitted with Palmer wheels and tyres, and that three were among the first five to finish, including Flt. Lt. Tommy Rose's Miles Hawk, which secured second place. The table of winners' equipment in last week's issue indicated a somewhat curious combination as far as Flt. Lt. Rose's undercarriage was concerned. Wheels as well as tyres were, of course, Palmers.